CONTENTS OF VOLUME XXXIII.

NUMBER I.

PAGE

1. **Report of 312 Cases of Cataract Extraction with a Small Peripheral Button-Hole in the Iris.** By Dr. H. BECKLES CHANDLER, Boston 1

2. **Delirium after Eye Operations.** By Dr. C. E. FINLAY, Havana, Cuba 5

3. **Ruptures of the Iris.** By Prof. L. WEISS and Dr. W. KLINGELHOEFFER, Mannheim. Translated from *Arch. f. Augenheilkunde*, xxxix., July, 1899, by Dr. MATTHIAS LANCKTON FOSTER. (With three figures on Plate XIV., *Arch f. A.*, xxxix., 1899) 9

4. **Abstracts of Articles in Vol. XXXVIII. of the German Edition, not Previously Translated.** By Dr. MATTHIAS LANCKTON FOSTER 27

5. **Sarcoma of the Orbit. Report of a Case Cured by the X-Ray.** By L. WEBSTER FOX, A.M., M.D., Philadelphia. (With three figures on Text-Plate I.) 31

6. **Biography of Herman von Helmholtz, with Personal Recollections.** By HERMAN KNAPP. (*To be continued*) . . 36

7. **Report of the Transactions of the Ophthalmological Society of the United Kingdom.** By C. DEVEREUX MARSHALL, F.R.C.S. 54

8. **Report of the Transactions of the Ophthalmic Section of the British Medical Association, Annual Meeting at Swansea, July, 1903.** By C. DEVEREUX MARSHALL, F.R.C.S. . . 62

9. **Systematic Report on the Progress of Ophthalmology in the Fourth Quarter of the Year 1902.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O.

137776

PAGE

BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Dr. KRAHNSTÖVER, Rome; Mr. C. DEVEREUX MARSHALL, London; Dr. P. VON MITTELSTÄDT, Metz; Prof. DA GAMA PINTO, Lisbon; Dr. HEINRICH SCHULZ; and others. Translated by Dr. WARD A. HOLDEN 77

(*Concluded from page 616 of Vol. XXXII.*)

A.—Dr. O. BRECHT: Lens, 77; Iris, 79; Choroid, 80; Vitreous, 81; Glaucoma, 82; Sympathetic ophthalmia, 83.

B.—Dr. V. HASELBERG: Retina and functional disturbances, 83; Optic nerve, 86; Injuries, foreign bodies, parasites, 87; Ocular disturbances in general diseases, 92.

10. **Book Reviews** 94

I.—Klinische Studien über die Krankheiten der Retinalgefaesse. (Clinical Studies on the Diseases of the Retinal Blood-Vessels.) By Dr. OLE BULL.

II.—Die augenärztlichen Operationen (The Operations on the Eye). By Prof. WILHELM CZERMAK, M.D.

III.—Manual of the Diseases of the Eye. By Dr. CHAS. H. MAY.

IV.—Grundriss der Augenheilkunde, von Dr. CHAS. H. MAY. Translation into German by E. H. OPPENHEIMER.

V.—Elementary Ophthalmic Optics. By FREELAND FERGUS, M.D., F.R.C.S.E.

VI.—Atlas of the External Diseases of the Eye, Including a Brief Treatise on the Pathology and Treatment. Second Edition. By Prof. O. HAAB, M.D. Authorized translation. Edited by Dr. G. E. DE SCHWEINITZ.

VII.—Lessons on the Eye, for the Use of Undergraduate Students. By FRANK L. HENDERSON, M.D.

VIII.—Ocular Therapeutics, According to the Most Recent Discoveries. By Dr. A. DARIER, Translated by SYDNEY STEPHENSON.

IX.—Diseases and Injuries of the Eye, with their Medical and Surgical Treatment. By GEO. and ARNOLD LAWSON.

X.—Text-Book of Diseases of the Eye, for Students and Practitioners of Medicine. By Drs. HOWARD F. HANSELL and W. M. SWEET.

11. **Obituary** 99

Dr. Ernst Pflüger; Dr. Simon Pollak; and Dr. Ricardo Secondi.

NUMBER 2.

PAGE

1. **Diffuse Sarcomata of the Uveal Tract.** By J. HERBERT PARSONS, M.B., B.S., B.Sc. (Lond.), F.R.C.S. (Eng.). (With four photographic reproductions on Text-Plates II. and III.) . . 101

2. **Epithelial Cystoma of the Conjunctiva (Dermo-Epithelioma of Parinaud).** By EDWARD L. OATMAN, M.D., of Brooklyn, N. Y. (With Text-Plates IV.–VIII.) 113

3. **A Choroidal Sarcoma Which Spread in a Peculiar Manner and Contained Cholesterin Crystals.** By Dr. BROWN PUSEY, Chicago. (With two figures on Text-Plate IX.) . . . 125

4. (1) **Osmotic Disturbances as the Cause of Glaucoma**—(2) **Experimental Production and Clearing of Cataractous Lenses.** By Dr. BROWN PUSEY, Chicago 128

5. **A Subconjunctival Angiofibroma of the External Rectus, with Hyaline Degeneration.** By Dr. J. GONIN. (With three figures on appended Plate V. of Vol. XXXIX., German Edition, April, 1899.) Translated by Dr. JOHN MIDDLETON . . 133

6. **A Case of Persistent Œdema of the Eyelid Due to Syphilis.** By E. F. SNYDACKER, B.A., M.D. 139

7. **A Case of Primary Sarcoma of the Ciliary Body.** By JAMES W. BARRETT, M.D., M.S., F.R.C.S. Eng., and W. F. ORR, M.B., B.S. (With one text-figure.) 144

8. **Reports of the Meetings of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL . 150

9. **Report of the Meetings of the German Ophthalmological Society at Heidelberg, September 14–16, 1903.** By Dr. W. MERTENS, of Wiesbaden. Translated from Vol. XLVIII., German Edition, October, 1903, by Dr. MATTHIAS LANCKTON FOSTER 157

10. **Report of the Transactions of the Section of Ophthalmology of the New York Academy of Medicine, Monday Evening, December 21, 1903.** By Dr. ARNOLD KNAPP, Acting Secretary 189

11. **Systematic Report on the Progress of Ophthalmology in the First Quarter of the Year 1903.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Dr. KRAHNSTÖVER, Rome; Mr. C. DEVEREUX MARSHALL, London; Dr. P. VON MITTELSTÄDT, Metz; Dr. H.

PAGE

SHULTZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Translated by Dr. WARD A. HOLDEN. 195

A.—Prof. HORSTMANN: General ophthalmological literature, 195; General pathology, diagnosis, and therapeutics, 197; Instruments and remedies, 203.

B.—Dr. G. ABELSDORFF: Anatomy, 207; Physiology, 208; Refraction and accommodation, 210; Muscles and nerves, 212.

C.—Dr. R. SCHWEIGGER: Lids, 214; Lachrymal apparatus, 215; Orbit and neighboring cavities, 216; Conjunctiva, 217; Cornea, 218.

D.—Dr. O. BRECHT: Lens, 220; Iris, 221; Choroid, 222; Vitreous, 222; Glaucoma, 223; Sympathetic ophthalmia, 224.

E.—Dr. H. MEYER: Retina and functional disturbances, 224; Optic nerve, 226; Injuries, foreign bodies, parasites, 229; Ocular affections in general diseases, 230.

12. **Book Notices** 233

XI.—Squint Occurring in Children. An Essay. By EDGAR A. BROWN, F.R.C.S.Ed., assisted by EDGAR STEVENSON, M.D., M.Ch. Aberd.

XII.—The Eye: its Refraction and Diseases. Vol. I. The Refraction and Functional Testing of the Eye. By EDWARD E. GIBBONS, M.D.

XIII.—Die Functionsprüfung des Auges u. ihre Verwerthung für die Allgemeine Diagnostik. By Prof. O. SCHWARZ, M.D.

XIV.—Biographic Clinics. Vol. II. The Origin of the Ill-Health of George Eliot, Geo. H. Lewes, Wagner, Parkman, Jane Welch Carlyle, Spencer, Whittier, Margaret Fuller Ossoli, and Nietzsche. By GEO. M. GOULD, M.D.

XV.—Diseases of the Eye. By L. WEBSTER FOX.

XVI.—The American Year-Book of Medicine and Surgery. A Yearly Digest of Scientific Progress and Authoritative Opinions in All Branches of Medicine and Surgery, with Critical Editorial Comments. Under the general editorial charge of GEO. A. GOULD, M.D.

13. **Miscellaneous Notes** 238

NUMBER 3.

1. **Sarcoma of the Choroid with Destructive Hemorrhage.** By F. H. VERHOEFF, A.M., M.D., Boston. (With Text-Plate X.) 241

2. **A Case of Empyema of the Right Frontal Sinus, of the Right Sphenoidal Sinus, of Both Antra of Highmore, and of the Ethmoidal Cells on Both Sides.** By A. L. WHITEHEAD, M.B., B.S., London 252

PAGE

3. **Hemorrhages in the Eye, Present at Birth.** By Dr. EDWARD B. COBURN, New York. (With three figures on Text-Plate XI.) 256

4. **Paralysis of the Associated Lateral Eye Movements, Presumably Due to Acute Poliencephalitis Superior, Ending in Recovery.** By Dr. H. GRADLE, Chicago 268

5. **Hereditary Ectopia Lentis, with Reports of Cases.** By Dr. G. GRIFFIN LEWIS, Syracuse, N. Y. (With Text-Plates XII. and XIII.) 275

6. **Etiology and Pathology of Corneal Cysts, with Report of a Case.** By E. L. OATMAN, M.D., Brooklyn, N. Y. (With four figures on Text-Plates XIV. and XV.) 287

7. **Hysterical Iridoplegia and Cycloplegia, with Report of a Case.** By MORTIMER FRANK, M.D., B.Sc. (Mass. Inst. Tech.), Chicago, Ill. (With two figures on Text-Plate XVI.) 299

8. **Report of a New Method for the Application of Local Anæsthesia in Operations on the Eyeball and Eyelids, Especially in Trachoma.** By Dr. J. GUTTMAN, New York 302

9. **Reports of the Meetings of the Ophthalmological Society of the United Kingdom, Held January 28, February 11, and March 10, 1904.** By Mr. C. DEVEREUX MARSHALL . . 312

10. **Reports of the Meetings of the Ophthalmological Section of the New York Academy of Medicine, Held January 18 and February 15, 1904.** By Dr. H. W. WOOTTON, Secretary 319

11. **Systematic Report on the Progress of Ophthalmology in the Second Quarter of the Year 1903.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Dr. KRAHNSTÖVER, Rome; Mr. C. DEVEREUX MARSHALL, London; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULTZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Translated by Dr. WARD A. HOLDEN. 329

A.—Prof. C. HORSTMANN: General ophthalmological literature, 329; General pathology, diagnosis, and therapeutics, 331; Instruments and remedies, 334.

B.—Dr. G. ABELSDORFF: Anatomy, 336; Physiology, 337; Refraction and accommodation, 339; Muscles and nerves, 341.

C.—Dr. R. SCHWEIGGER: Lids, 347; Lachrymal apparatus, 348; Orbit and neighboring cavities, 350; Conjunctiva, 351. (*To be Continued.*)

12. **Notices.** 355

NUMBER 4.

PAGE

1. **Empyema of the Frontal Sinus — Orbital Complication Treated by Superheated Steam.** By Dr. DAVID DENNIS, Erie, Pa. 357

2. **Choroidal Hemorrhage Following Cataract Extraction.** By ALEX. QUACKENBOSS, A.M., M.D., Boston 362

3. **Trachoma among the Ancient Greeks and Romans.** By Dr. C. V. FUKALA, Brooklyn 366

4. **Extirpation of the Lachrymal Sac after Injection of Paraffin.** By Dr. FRANK C. TODD, Minneapolis, Minn. 373

5. **A New Formation of Elastic Tissue in the Anterior Chamber of the Eye.** By Dr. ALFRED WIENER, New York. (With Plate V. of Vol. XLVIII., German Edition) 377

6. **Hereditary Optic Atrophy.** By Dr. ARNOLD KNAPP . . 383

7. **Severe Pseudo-Membranous Conjunctivitis in an Infant Presumably Due to the Influenza Bacillus.** By Dr. ARNOLD KNAPP 386

8. **Parinaud's Conjunctivitis.** By Dr. F. H. VERHOEFF and Dr. G. S. DERBY, Boston. (With two figures on Text-Plate XVII.) 389

9. **Fibro-Myoma of Bulbar Conjunctiva.** By KENNETH SCOTT, M.D., F.R.C.S., London 413

10. **The Relation between the Ocular Muscles and Refraction.** By Dr. S. M. PAYNE, New York. (With two drawings in the text) 416

11. **Report of the Meeting of the Ophthalmological Society of the United Kingdom.** By Mr. C. DEVEREUX MARSHALL . 435

12. **Systematic Report on the Progress of Ophthalmology in the Second Quarter of the Year 1903.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam: Dr. KRAHNSTÖVER, Rome; Mr. C. DEVEREUX MARSHALL, London; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULTZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Translated by Dr. WARD A. HOLDEN 439

A.—Dr. R. SCHWEIGGER: Cornea, sclera, anterior chamber, 439. (*Continued from page 354.*)

B.—Dr. O. BRECHT: Lens, 444; Iris, 446: Choroid, 448; Vitreous, 449; Glaucoma, 451; Sympathetic ophthalmia, 452.

PAGE

C.—Dr. H. MEYER: Retina and functional disturbances, 453; Optic nerve, 456; Injuries, foreign bodies, parasites, 458; Ocular affections in general diseases, 459.

13. **Miscellaneous Note** 461

NUMBER 5.

1. **A Bacteriological Study of Trachoma, with Remarks on the Occurrence of the Influenza Group of Bacteria in Conjunctivitis.** By Dr. ARNOLD KNAPP 463

2. **An Unusual Dilatation of the Superior Temporal Artery and Vein of the Retina.** By Dr. B. L. MILLIKIN, Cleveland, Ohio. (With one drawing on Text-Plate XVIII.) 471

3. **Adeno-Carcinoma of the Eyelid.** By Dr. J. M. MILLS, New York. (With Text-Plates XIX. and XX.) 474

4. **Glaucoma Simplex.** By Prof. C. HORSTMANN, Berlin. Translated from Vol. XLII., October, 1900, German Edition, by Dr. MATTHIAS LANCKTON FOSTER 489

5. **A Peculiar Change in the Choroid after Ophthalmia Nodosa.** By Dr. W. REIS, Bonn. Translated from the *Arch. f. Augenheilk.*, XLVI., Dec., 1902, by Dr. MATTHIAS LANCKTON FOSTER. (With Plate XIII. of Vol. XLVI., German Edition) 502

6. **Report of Two Cases of Family Macular Degeneration of the Cornea.** By Dr. CLARENCE A. VEASEY, Philadelphia . 510

7. **A Case of Pseudoleucæmic Lymphomata of the Eyelids, Followed by a Generalized Formation of Lymphomata.** By Dr. ALFRED ALBERT DUTOIT, Berne. Translated from *Arch. f. Augenheilk.*, XLVIII., 2, Aug., 1903, by Dr. MATTHIAS LANCKTON FOSTER 513

8. **The Present Status of Cervical Sympathectomy for Glaucoma Simplex.** By Dr. ROBERT G. LORING, Boston . . 529

9. **Report of the Meeting of the Ophthalmological Society of the United Kingdom, June 9, 1904.** By Mr. C. DEVEREUX MARSHALL 545

10. **Report of the Meetings of the Ophthalmological Section of the New York Academy of Medicine, April 18 and May 16, 1904.** By Dr. H. W. WOOTTON, Secretary 548

11. **Systematic Report on the Progress of Ophthalmology in the Third Quarter of the Year 1903.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Dr. KRAHNSTÖVER, Rome; Mr. C. DEVEREUX

PAGE

MARSHALL, London; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULTZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others. Translated by Dr. WARD A. HOLDEN . . . 555

A.—Prof. C. HORSTMANN: General ophthalmological literature, 555; General pathology, diagnosis, and therapeutics, 556; Instruments and remedies, 560.

B.—Dr. G. ABELSDORFF: Anatomy, 561; Physiology, 561; Refraction and accommodation, 562; Muscles and nerves, 565.

C.—Dr. R. SCHWEIGGER: Lids, 567; Lachrymal apparatus, 569; Orbit and neighboring cavities, 569; Conjunctiva, 572; Cornea, 575.

NUMBER 6.

1. **Report of a Case of Melano-Sarcoma of the Limbus in an Eye with Normal Vision, Followed by Enucleation.** By Dr. GEORGE HUSTON BELL, New York. (With two figures on Text-Plate XXI.) 579

2. **Fuchs's Peripheric Atrophy of the Optic Nerves.** By Dr. K. KIRIBUCHI, Tokyo. Abridged Translation by Dr. WARD A. HOLDEN. (With five drawings on Plates III. and IV. of Vol. XXXIX., 1, of *Archiv für Augenheilkunde*, April, 1899) 586

3. **Clinical Contribution to the Study of the Innervation of the Iris.** By Dr. C. MAGNANI, Turin 591

4. **The Important Clinical Points in Perimetry, with Special Reference to Traumatic Neurosis.** By Dr. L. WOLFFBERG, Breslau. Abridged Translation from *Archiv f. Augenheilkunde*, XLVII., 4 (June, 1903), by Dr. WARD A. HOLDEN . 597

5. **The Gonococcus Theory.** By Dr. HERMANN URBAHN, of Berne. Translated by Dr. MATTHIAS LANCKTON FOSTER, from *Arch. f. Augenheilk.*, Vol. XLIV., Supplementary Number (1901) 610

6. **Abstracts of Articles in Vol. XXXIX. of the German Edition, 1899, not Previously Translated.** By Dr. MATTHIAS LANCKTON FOSTER, New York 635

VON SICHERER: Sterilization of India ink for tattooing the cornea, 635. FUKALA: Refraction in ancient times: A contribution to the history of refraction based on literary material hitherto unknown, 635. FUKALA: Further contributions to the ancient history of refraction: Greek theories regarding vision and color, 636. PERGENS: Remarks on Fukala's refraction in ancient times, 636. WALTER: Follicular conjunctivitis and trachoma, 637. WOLFF: Operations to improve the mobility of artificial eyes: A new prothesis of special form, 637. COHN: Herpes zoster ophthalmicus,

PAGE

637. ¡WILBRAND: Hysterical ptosis, 638. JAESCHE: Binocular vision, 639. MOHR and SCHEIN: Keratosis conjunctivæ, 639. BIETTI: Elastic tissue in human eyes, 639. WALTER: Open treatment after operations on the eyes, 640. WEISS: What value has the X-ray photography in the detection of foreign bodies within the eye? 640. BOTWINNIK: Changes of astigmatism under certain physical and physiological influences, 641. PICK: Tortuosity of retinal vessels, 642.

7. **The Cortical Reflex of the Pupil.** By Prof. O. HAAB, of Zurich. Translated from the German Edition, October, 1902, by Dr. MATTHIAS LANCKTON FOSTER 643

8. **Report of the Ophthalmic Section of the British Medical Association Meeting at Oxford, July 26-29, 1904.** By Mr. C. DEVEREUX MARSHALL 662

9. **Systematic Report on the Progress of Ophthalmology in the Third Quarter of the Year 1903.** By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others. Translated by Dr. WARD A. HOLDEN 682

D.—Dr. O. BRECHT: Lens, 682; Iris, 683; Choroid, 684; Vitreous, 685; Glaucoma, 685; Sympathetic ophthalmia, 685.

E.—Dr. H. MEYER: Retina and functional disturbances, 686; Optic nerve, 689; Injuries, foreign bodies, parasites, 691; Ocular disturbances in general diseases, 693.

10. **Index to Authors and Subjects of Vol. XXXIII.** . . . 697

ARCHIVES OF OPHTHALMOLOGY.

REPORT OF 312 CASES OF CATARACT EXTRACTION WITH A SMALL PERIPHERAL BUTTON-HOLE IN THE IRIS.

By Dr. H. BECKLES CHANDLER,

SURGEON TO THE MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY.

TO the October number, 1890, of the *Boston Medical and Surgical Journal* I contributed a short article reporting 50 cases of senile cataract extractions I had performed, in which simple extraction had been modified by making a small peripheral opening in the iris.

Having continued the same operation with almost uninterrupted success, I felt justified, as the number now reported is so much larger, in again writing on the same subject.

Previous to the year 1888, I, following the example of all the surgeons at the Infirmary, had been performing modified Graefe in senile cataracts. It was about this time that simple extraction, having come into favor, and having the endorsement of some of the most experienced operators, and being an ideal operation when successful, was adopted by me as well as some of the other surgeons in certain selected cases. The success attending my first efforts encouraged me to extend my operation to a wider field. I soon, however, had a check to my enthusiasm by a prolapse taking place in the eye of a patient in the wards of the Infirmary. Ether was given, however, and the prolapse excised; another prolapse followed shortly after, and still further reduced my confidence.

The last operation I performed with simple extraction was on an old lady of eighty-four, of nervous temperament, living in one of the suburbs of Boston; in this case prolapse

occurred on the second night. On the third morning, when I examined the patient's eye, I found a very large prolapsed iris completely filling the corneal wound. I attempted to replace it unsuccessfully. I therefore suggested ether in the case, but her family and physician stoutly opposed its use, and, after several attempts, I succeeded in removing a portion of the prolapsed iris, but her eye, until her death, although having fair vision, was a source of constant irritation.

The anxiety and worry over this last case resulted in my abandoning simple extraction and returning to the modified Graefe, which, although not artistic in final results, at least relieved one from anxiety.

About this time a patient came under my care suffering from an injury, a piece of steel having become imbedded in the structure of the iris. The corneal wound was about three or four *mm* long and situated near the periphery of the cornea; the iris had prolapsed into the wound and the anterior chamber was re-established. The magnet was used and a small scale of steel, about the size of the wound, was removed. As soon, however, as the anterior chamber was established, the iris was pushed up again into the wound, and, after several futile attempts to replace it and keep it in position, I decided the only way I could do so was by making a nick through the iris so that the aqueous would drain off and continue draining until the wound healed. The ultimate result was perfect, the pupil being round and central. It occurred to me, therefore, if this operation could be utilized in simple extraction, it would have the same influence in preventing prolapse.

Since then I have operated on 312 cases, senile cataracts with one or two exceptions, by this method, the patients being over forty years of age, and, in place of cutting through the iris with my knife, as I had in the case of the injury, I decided to remove a piece one *mm* in diameter, making a round opening as near to the root of the iris as possible. The object in making the opening of this size is twofold: it not only allows drainage, but the cortical, that always collects above and under the iris, can also be expressed through

this opening, and in washing out the anterior chamber the fluid used will flow backwards through the opening, carrying with it the debris.

In performing this operation I try to make my cut exactly in the corneo-scleral junction, expressing the lens in the usual manner, but do not use any force, after the lens has been delivered, to keep the iris prolapsed, knowing that I can remove the cortical through the hole in the iris. The result is that I have had only three cases of loss of vitreous in the 312 extractions, and one of these occurred by my endeavoring to remove an opaque capsule.

All told there were four cases of prolapsed iris, two of them the direct result of violence, one occurring on the tenth day, patient striking her eye on the edge of a table, another struck a door-knob in endeavoring to pick up a handkerchief from the floor; this also occurred after the anterior chamber had been re-established; the two others occurred on the second day, and in both these cases, the opening had been made too far forward.

I feel justified in thinking from my experience that the cause of prolapse is found in two factors: the most important one is a flabby iris; the other is a tardy closure of the wound. Where the iris has lost its tone and the wound unites but breaks down readily with the movement of the eye or spasm of the lids, we have a sudden gush of aqueous and, with this gush, our iris goes.

The use of eserin or pilocarpin to tone up the sphincter of the iris results in posterior synechiæ, even when atropin is used the following day, in a large percentage of cases.

The suggestion has been made that the swelling of the cortical under the iris induces the prolapse; I think, however, that it would be more likely to induce an incarceration than a prolapse.

It is absolutely necessary in making this small opening through the iris to have a forceps the teeth of which are at the tip-end, and scissors whose blades are very thin, otherwise the opening is made larger and farther down than intended.

I have usually made the opening after I have extracted

the lens, as it has seemed that the small amount of aqueous under the iris acted as a buffer and facilitated its extraction.

I have made no comparison, as to the results, between the von Graefe operation and the modified simple extraction, as my object was to keep a record of prolapses. No selection of cases was made after the first fifty. Even where the projection was doubtful, the operation was performed and not excluded from my report as complicated cataract.

The fundus showed the following pathological states: two cases of choroiditis, one of disorganized vitreous after foreign body had been removed from the globe, two separated retinæ, three of high myopia, with choroidal changes around the macular region.

Iritis occurred in varying degrees in thirty-two eyes, of which three resulted in blocked pupil. The total number of eyes lost was four, three from corneal suppuration and one from panophthalmitis.

Secondary operation was performed in sixty-seven cases without any inflammatory reaction.

The resulting visions given below were taken, in a majority of cases, at the time of discharge, and no doubt many of them improved materially. Taking all visions above one tenth as successful, one twentieth as moderate, one thirtieth as fair, fingers and projection poor, we have:

Successful	91.2%
Moderate	3.5%
Fair	2.6%
Poor	1.2%
Lost	1.5%

The average stay of patients in Infirmary was eighteen and two-thirds days.

DELIRIUM AFTER EYE OPERATIONS.

By Dr. C. E. FINLAY, Havana, Cuba.

In 1900, Dr. C. Fromaget, of Bordeaux, published a most instructive paper[1] on this obscure post-operative accident, in which, after reviewing in detail the different theories which have been adduced in explanation of its etiology, and finding them all unsatisfactory, he maintains that it has all the characteristics of a toxic delirium, in accordance with the views expounded by Regis and Chevalier Lavaure[2] since 1893, with regard to delirium following operations in general, the source of the intoxication being endogenous or exogenous. The delirium following eye operations, Fromaget considers as the result of an auto-intoxication, most often uræmic, and due to the accumulation in the system of some excrementitious products brought about by some renal insufficiency, and which is made patent by a diminution in the amount of urine, in its specific gravity, or in the proportion of urea. In support of these views, he reports two cases, one of which was finally fatal, in which the uræmic origin of the delirium was clearly proved.

This paper of Fromaget has remained entirely unnoticed, and at a recent meeting of the Ophthalmological Section of the New York Academy of Medicine,[3] neither in an original paper by Dr. Kipp, reporting twelve cases of this accident, nor in the discussion which followed it,[4] was there the slightest allusion made to this etiological factor. Furthermore, I have not been able to find any mention of it in either the

[1] *Ann. d'Ocul.*, cxxiii., 183.
[2] Congrès des Aliénistes de la Rochelle.
[3] May 18, 1903.
[4] Arch. of Ophth., xxxii., 4, 374 and 395.

French or other ophthalmological literature, before or after Fromaget's publication.

Under these circumstances, I feel bound to report a case of violent delirium, which I had to deal with, in connection with a cataract extraction, shortly after the appearance of the above-mentioned paper.

A. P., an Italian woman, sixty-six years of age, rather pale and weakly, was sent by the Italian Consul to "Mercedes" Hospital, of Havana, for treatment of mature senile cataracts of both eyes, on July 13, 1900. The superficial examination of her urine on admission only revealed a trace of albumen. On the morning of July 16th, I performed an uncomplicated simple extraction of the cataract on the left eye, after the operation applying, as usual, a binoculus. That night she became violently delirious, getting up several times, tearing off her bandage, etc.; morphine injected hypodermically—if anything—made matters worse, the patient having to be restrained. The next morning the patient was quieter; I uncovered the sound eye, prescribed a saline purgative, barley water for constant use, and potassium bromide and chloral to be taken at night. I ordered the urine to be collected. Its examination the next morning showed it to be remarkably scanty, and that the proportion of urea was considerably diminished. The following table shows the variations in the urinary analyses during the time she was under observation:

Date.	Quantity.	Reaction.	Sp. Gr.	Alb. ?	Sugar.	Urea (Per litre).
July 15th		Acid	1020	Trace		
" 16th	Operation, left eye					
" 18th	350 G	Alk.	1025	Trace		3.00 G
" 19th	250	Acid	1024	None	Trace	
" 22d	360	Acid	1020	Trace	2 G	
" 23d	600	Acid	1016	Trace	2 G	
" 24th	1000		1014	Trace	Sugar	6.38 G
" 26th	900			Trace	Sugar	5.56 G
" 30th	1650	Acid	1011	None	Sugar	
" 31st	600	Acid	1010	None	2.3 G	5.60 G
Aug. 4th	700		1015	Trace		3.48 G
" 9th	1600	Acid	1014	None	Trace	
" 10th	1030		1017			3.48 G
" 14th	700		1010	None	Trace	3.19 G
" 24th	500		1012			6.17 G
	Operation, right eye					
" 25th			1016	0.30	None	5.31 G

As can be seen, the daily quantity of urine varied somewhat, the specific gravity being higher when the urine was more scanty. The proportion of urea is also seen to differ, an increase being noted on the whole during the time the patient was under observation, but always remaining far below normal. The amount of albumen present was very small. A certain amount of sugar was at times present. The nervous symptoms, more pronounced at night, persisted for several days, gradually diminishing in intensity. The healing progressed favorably, the only imperfection being a small anterior adhesion with a slight drawing of the pupil towards the operative scar. The general health, nutrition, and heart action (which was slightly irregular, with a high-tensioned pulse at the onset) having greatly improved under a tonic and diuretic treatment, the right eye was operated on August 24th, only the one eye being bandaged, and potassium bromide administered at night. The night after the operation, there was some nervousness, but none of the excitement of the first time. The healing took place without further accident, the patient being discharged with good sight in both eyes at the end of a fortnight with instructions to look after her general health; she has not been heard of since.

Although I have had several cases of extreme nervousness and unruliness after eye operations, especially after cataract extractions, the preceding is the only one of out-and-out delirium of the violent type not of alcoholic origin which I have had in 294 cataract extractions. The uræmic origin of the delirium seems to me quite evident after considering the urinary analyses. Darkness as an etiological factor can be eliminated, as owing to there being at the time no special eye ward for female patients at Mercedes Hospital, this one was treated in the gynæcological ward, in which there is a superabundance of light and air. Atropine was not used at the operation, so that it can also be discarded as a causative agent. The patient was entirely destitute and homeless when she was sent to the hospital by the Italian Consul, her only daughter having recently died intestate, leaving a small amount of money, which could not, however, be touched till legal proof had been adduced that there were no nearer heirs, so that although "homesickness" can also be excluded, not so the psychic influence of her daughter's recent demise and

the worry consequent on her financial troubles, her blindness, and the natural fear of an operation. This, however, as well as the mental shock of the operation itself, cannot alone explain the outbreak. It may, however, have acted as the last straw which provoked a renal insufficiency in a patient with a prior kidney lesion, but a more direct influence cannot be attributed to it.

The influence of occlusion of both eyes was, in my opinion, purely secondary and of the same importance as the psychic influence just mentioned, the non-appearance of the delirium after the second operation depending on the improved general health and increased elimination of urea.

I do not, of course, conclude from the study of one case that every case of post-operative delirium in ocular surgery is of uræmic origin, but this one wholly corroborating Fromaget's views is most striking, and shows that these are at least worthy of an investigation at the hands of other observers, special attention being paid to the detection of a diminution in the amount of urea eliminated, or in the total quantity of urine excreted daily, which may exist without the presence of a large amount of albumen.

RUPTURES OF THE IRIS.

By Prof. L. WEISS and Dr. W. KLINGELHOEFFER, of Mannheim.

Translated from *Arch. f. Augenheilkunde*, xxxix., July, 1899, by Dr. Matthias Lanckton Foster.

(*With three figures on Plate XIV., Arch. f. A., xxxix., 1899.*)

In 1886, E. Franke (1) called attention to injuries of the iris, aside from iridodialysis, caused by contusions of the eye. These consist of more or less deep lacerations of the sphincter of the pupil, or of ruptures of the portion of the iris which lies between the ciliary and pupillary margins. Such injuries, particularly the latter, have rarely been described. Franke could collate only the small number of twelve cases from the literature prior to 1886; he added one at that time, and in a later paper five more (2), making a total of eighteen cases up to the year 1887.

Pfalz (3) next reported the case of an eight-year-old boy who was struck in the eye with a stone. There was a wound in the skin of the left side of the nose on a level with the inner canthus. There was a furrow in the lower-outer part of the cornea which ran into the sclera. The conjunctiva was uninjured. Hyphæma was present. The pupil was dilated almost *ad maximum*, especially above, where there were two deep lacerations of its margin with a number of superficial notches between them. Of the two lacerations, which involved the entire thickness of the iris, the temporal one extended over almost its entire breadth and left only a small peripheral border, while the nasal extended over only half its breadth. Delicate grayish-white tissue fibres bridged

over the angle from one margin to the other. Above there was a rupture which involved the outer layer of the iris and left the pigment layer intact. The vitreous was at first cloudy. After it became clear a white crescent could be seen downward and outward from the papilla, as well as similar changes in the region of the macula. The myopia was increased. This was ascribed to the weakening of the posterior section of the globe by numerous little lacerations. The pupil remained moderately dilated, but its lower portion reacted promptly to light. Accommodation was not disturbed. The blow was probably received on the lower part of the eye; the iris was lacerated on the upper.

Blank (4) reported a case of triangular rupture of the iris. There was a superficial abrasion of the corneal epithelium, hyphæma, and dislocation of the cloudy lens to the nasal side. Two ruptures passed upward and to the temporal side from the margin of the pupil almost to the ciliary insertion. The piece of iris included between the two ruptures was folded back at its apex. Outward and downward was a smaller rupture which involved only the sphincter. The pupil was moderately dilated.

Pohlenz (5) described two cases. In one there was a laceration of the temporal margin of the pupil together with dislocation and partial cloudiness of the lens. There was a hemorrhage at the macular border of the papilla. The upper-outer part of the retina was grayish white. After the blood in the anterior chamber had been absorbed, a laceration of the temporal margin of the pupil could be seen, as well as an aperture 1*mm* in diameter in the epithelium of the iris, separated from the laceration by a bridge of the same width. Later chorio-retinitis could be seen at the site of the retinal opacity.

In the other case there was a very small rupture which slightly notched the temporal side of the pupil. There were also a coloboma of the pigment epithelium, hyphæma, and chorio-retinitis about the macula and optic disc. The corresponding sector of the disc was white and atrophic. Vision was $\frac{5}{15}$. There was a large paracentral, absolute scotoma.

This writer also mentioned six other cases of rupture

of the iris without giving the clinical histories. Of the eight cases, five were complicated by dislocation of the lens, three by opacity of the lens, six by ruptures of the choroid. Twice a solution in the continuity of the iris was found near the ruptures in the margins of the pupil; once there was a coloboma of the pigment epithelium.

Harlan (6) reported six cases with their clinical histories. The first was that of a man who was knocked unconscious by a blow on the right brow and eye with a chair. Twenty hours later the pupil was irregularly dilated and immovable. There was a notch in its temporal border, a little above the horizontal meridian, which extended to within 3*mm* of the periphery of the iris. In the apex of this notch a network of fine thread-like fibres was visible. There were also numerous minute serrations in the margin of the pupil. By transmitted light fourteen radiating ruptures could be seen in the tissue of the iris. Eserine reduced the size of the pupil, but when discontinued the pupil resumed its former width. The vision was good. Accommodation less than in the sound eye. The fundus was normal.

In the second, a boy fourteen years old, the pupil was widely dilated and fixed four hours after the injury. Two days later the pupil was rather less dilated. Very little reaction to light. Three small lacerations could be seen in the lower margin of the pupil. A week after the injury the vision and accommodation were the same as in the right eye. Eserine was of very little use. Four weeks after the injury there was a rather more decided reaction of the upper and lateral margins of the pupil, but the lower margin was motionless.

A boy, eight years old, was struck in the right eye with a small piece of wood. Four days later there was a loss of corneal epithelium over the pupillary area, hyphæma; the pupil was dilated and fixed, the iris discolored, the tension slightly reduced. There were two minute breaks half a millimetre long in the lower portion of the edge of the pupil. In the upper-outer margin was another rupture and between these several little notches. At first the fundus could not be seen, later a rupture of the choroid was revealed.

The pupil remained dilated during the entire time it was under observation. Eserine did not work well. Later a whitish opacity appeared in the anterior cortical substance of the lens.

The fifth case was that of a man sixty-two years old who had been struck in the eye with a stick of wood three years before. There were two ruptures, downward and outward, of the circular fibres of the iris and the portion of iris between them was inverted. The lens was slightly hazy and there were floating opacities in the vitreous. Vision = fingers at 43*cm.*

A man, twenty-six years old, had received a blow on his right eye three years before. Vision = $\frac{5}{15}$. Accommodation was the same as in the other eye. There was a corneal nebula, localized lenticular opacity, and a rupture of the choroid. The pupil was dilated and oval. It reacted to light except at its lower margin which was fixed. At this place there were two shallow notches. With a + 16 lens eight small radiating ruptures of the iris could be seen, six down and in, one down and out, one up and in. The iris was slightly tremulous.

Injuries of the iris without involvement of the ciliary and pupillary margins have also been described. Schmidt (7) tells of the following: A man thirty years old had received an injury to his right eye two days before. There was a large hyphæma. The eye was a little irritated. In the temporal part of the iris was a linear rupture, running vertically from above downward, distant about 1*mm* from the ciliary margin at each end and not involving the pupillary margin. Atropine acted promptly, and under its influence the rupture healed in about three weeks, leaving a scar so delicate that it could be seen only with difficulty.

Westphal (8) saw, after a blow with a footstool, opacities of the vitreous, paralysis of the sphincter, and iridodonesis. There were apertures like pin-holes in the upper, inner, and outer quadrants of the iris, which disappeared when eserine was instilled, but reappeared when the effect of the drug had passed off.

Reber (9), after the impact of a piece of coal upon the

closed eye of a man thirty-five years of age, saw hemorrhage into the anterior chamber, haziness of the lower part of the cornea, and a rent in the iris 3*mm* long, 1½*mm* from the inner limbus. The pupil was roundish, but distorted, and reacted fairly to light. Reber ascribed the tear in the iris to contrecoup. Vision = fingers at 1*m*. After some days the eye was free from irritation and the rupture had disappeared.

In Clark's case (10), a rebounding rifle-ball struck the right eye on the nasal side. The patient came under observation on the thirteenth day. The iris was dull and a little tremulous. The pupil was a little dilated and reacted slowly to light. There was an opening 1*mm* by 1½*mm* in diameter in the upper and inner part of the iris, with a very delicate membrane stretched across its upper part. There was an opacity of the lens at a place corresponding to this opening when the pupil was contracted. A partial rupture of the choroid ran upward and outward, parallel to the pupillary margin. Vision = $\frac{1}{6}$. Accommodation decreased.

Kazaurow (12) saw in a girl eleven years old, who had been struck in the eye with a cane, two rents through the entire thickness of the iris, which gaped wide, the angle pointing toward the ciliary body. The cornea, lens, retina, and choroid were intact. Vision finally = $\frac{1}{10}$.

Praun (16) saw in Eversbusch's clinic a man whose eye had been injured by a blow of the fist. There were six or eight little lacerations of the sphincter, hyphæma, and opacity of the lens.

The cases reported by Bouma (13) and Ginsberg (14) of ruptures of the pigment layer, or of the sphincter of the iris, were complicated by perforating wounds and should not be included here.

We can now add the following cases to the small number of ruptures of the sphincter hitherto reported:

Case 1.—P. M., twenty-nine years old. Struck in left eye with great force by a piece of wood July 15, 1897. Vision of the right eye $\frac{6}{7.5}$, of the left $\frac{6}{30}$. With the right eye could read Jaeger No. 1 from 35 to 12*cm*; with the left, Jaeger No. 3 from 30 to 18*cm*.

The left eye was much congested. There was a small central abrasion of the cornea, and hemorrhage into the deep anterior chamber. The tension was not reduced. The eye was tender on pressure. The pupil was irregular, dilated, and immovable. In the upper margin of the pupil was a small rupture through the entire thickness of the sphincter, and then extending superficially farther upward. The margin of the pupil was notched on each side. There were no large opacities in the vitreous and no hemorrhages in the fundus, but the papilla could not be plainly seen.

The blood in the anterior chamber was absorbed in the course of the following day. During the next night a fresh hemorrhage took place from the upper part of the iris accompanied by severe pain. The lower part of the anterior chamber was filled with bright red blood, the upper contained dark coagula. Eyeball tender; tension unchanged. The blood was gradually absorbed, the coagulum in front of the rupture last of all in two weeks.

Sept. 22d.—Vision of each eye $= \frac{6}{8 \cdot 5\ 7}$; with $+ 1, \frac{6}{6}$.

The left eye was unirritated and painless. The lower part of the pupil reacted sluggishly to light. The pupil was still irregular and dilated with a slight notch in its upper margin. A delicate network bridged the rupture. After the pupil had been dilated with atropine a slight opacity in the upper part of the lens was brought into view.

Oct. 23, 1898.—Vision of the right eye $\frac{6}{6}$; of the left $\frac{6}{1\ 6}$; $\frac{6}{1 \cdot 6}$ with $+ 1$. Left eye unirritated and painless, no change in cornea, tension normal. The left pupil was situated excentrically, was dilated, and reacted to light rather more sluggishly than the right. There was a notch in its upper margin crossed by a delicate network. Above this was a triangular, superficial tear in the iris. On the nasal side there was a slight notch in the margin of the pupil, on the temporal side a somewhat larger one where the pigment layer overlapped the edge. There was a delicate gray opacity on the anterior capsule in the upper and outer part of the pupil, which contained two denser white spots. (Fig. 1.)

The pupil responded well to the action of both atropine and eserine. There were no pathological changes in the fundus. The temporal half of the papilla was pale in each eye.

Case 2.—K. B., thirteen years old, struck in the right eye by an arrow, Aug. 13th. Immediately after the injury he could see nothing, but vision returned somewhat on his way home.

Aug. 14*th.*—Vision of left eye normal; of right eye $\frac{1}{60}$. Injection of the conjunctival and ciliary vessels of the right eye. Two wounds in the conjunctiva between the cornea and the caruncle, running parallel to the corneal margin. Subconjunctival hemorrhage at the nasal side and below. Tension a little below that of left. No pain or tenderness of the eyeball. Cornea normal except for a small old opacity in the upper-inner quadrant. Anterior chamber unevenly deep. Coagula of blood on the anterior capsule downward and inward, outward, and upward and outward. Pupil dilated, fixed, oval, and excentric, with a rupture in its lower-outer margin, and its upper-outer part covered by coagula. Nothing could be seen of the fundus except a red reflex. Projection good.

Treatment: ice and eserine.

Aug. 15*th.*—Pupil still dilated in spite of the eserine.

Aug. 16*th.*—No pain. Counted fingers at 1*m.* Pupil still dilated. Eserine continued.

Aug. 17*th.*—Little ciliary injection. Conjunctival wounds healing. Tension below that of left eye. The coagula in the anterior chamber had been absorbed, and now a large triangular rupture of the iris could be seen in the upper-outer part. The pupil had become still more widely dilated; the mouths of the ruptures gaped so as to give the pupil an oval form, and to cause it to lie excentrically upward and outward.

Aug. 18*th.*—Pilocarpine, two per cent., t. i. d.

Aug. 20*th.*—Pupil very widely dilated so as to lay bare the nasal border of the lens. Iris tremulous.

It now occurred to us that the great dilatation of the pupil might be due to the myotics which had increased the gaping of the ruptures by the contraction of the uninjured portion of the sphincter. The pilocarpine was therefore stopped, and on Aug. 23d, ten days after the injury, the pupil had contracted. The tension was normal. Vision = fingers at 2*m.*

Sept. 2*d.*—Vision of right eye $\frac{1}{60}$; $\frac{6}{20}$ with $-$ 7, a little better with cylinders. No pain or irritation of the eye. No change in the cornea. Anterior chamber deeper in the upper-outer part. Pupil misshapen, smaller than formerly, but still larger than the left, without reaction to light. Iris tremulous. There was a quadrilateral defect in the upper-outer part of the pupillary portion of the iris, the upper angle of which was bridged over by two bright gray threads. At the site of the lower rupture appeared a slight notch in the margin of the pupil. (Fig. 2.)

The dark-brown pigment layer of the iris was visible on the temporal side. In the upper-outer part of the iris were several clear places which perhaps were superficial lacerations. The vitreous had become clear and three white, spindle-shaped spots could be seen to form a curved line about a papillary diameter to the nasal side of the disc. In the periphery were two larger, white, spindle-shaped spots. The choroidal vessels were absent in all these places, the retinal vessels passed over them, and black pigment was to be seen in and about them.

Dec. 27th.—Vision of right eye $\frac{6}{18}$; with $-$ 1.5 $\frac{6}{12}$. Jaeger No. 2 could be read at from 15 to 13*cm.* All parts of the pupil reacted promptly to light. Eserine contracted the pupil especially on its nasal side.

Case 3.—Mr. F. received a violent blow on his left eye seventeen years ago when he was thirteen years old. Two weeks after the injury (1882), the vision in his right eye was $\frac{6}{6}$; in his left, fingers close to the eye; with $+$ 11 $\frac{6}{18}$; with $+$ 18 read Snellen 0.4. Diplopia. There was a scar in the upper lid running outward and downward. The eye was unirritated, painless, and of normal tension. The cornea was clear. There was a small iridodialysis on the temporal side, nearly in the horizontal diameter. Near the pupil there were two other small places in the iris through which the red reflex of the fundus could be seen. After atropine had been instilled, the pupil became irregularly dilated and oval. The iris was tremulous, the lens luxated upward. In the middle of the pupil was the notched lower border of the lens from which several fibres floated downward. The central part of the lens was cataractous.

The fundus could be seen clearly through the aphakic portion of the eye. After the atropine was stopped, the pupil remained oval, dilated, and fixed. Later a little reaction to light could be seen in the lower part of the pupil. The cataract gradually progressed. In 1883 the vision was $\frac{6}{24}$, with $+$ 10; Jaeger No. 5 could be read with much difficulty with $+$ 18.

Feb. 5, 1899.—Vision of right eye $\frac{6}{6}$, emmetropia; of left eye $\frac{6}{12}$ with $+$ 6. Read Jaeger No. 5 with $+$ 12. The left eye was divergent, unirritated, and painless. Tension good. No change in cornea. Anterior chamber deep. Iris tremulous. Pupil oval, dilated, reacted to light. There was a small iridodialysis temporally in the horizontal meridian, and four other places in the iris through which the red reflex could be seen. Three of the latter

were situated between the pupil and the iridodialysis, the fourth lay close to the margin of the pupil. The fibres of the iris were separated so as to pass around these places. The lens was cataractous and from its lower part hung several fine threads. About the papilla were marked concentric changes in the pigment epithelium. There was a large, absolute, central scotoma for white surrounded by a zone in which white appeared obscure. (Fig. 3.) The scotoma for blue was larger than that for white; that for red was smaller than that for blue below.

The blow must have struck the eye coming from above and forward, the patient said it came from the right and above. It is noteworthy that the hypermetropia of the injured eye diminished in the course of time.

In a footnote the author adds the following cases which came under his observation after this paper had been written.

Injury of the left eye of a man twenty-six years old by a falling brick. Vision of right eye, $\frac{6}{6}$; Jaeger No. 1 from 32 to 15 *cm.*; of left eye, $\frac{6}{20}$ to $\frac{6}{15}$; Jaeger No. 2 from 24 to 15 *cm.* Enlargement of the blind spot for colors in each eye. Deep triangular wound of the lower lid, its apex directed downward. Left pupil somewhat larger than the right. Direct reaction to light very slow, consensual rather better. Nasally and below there was a laceration of the pigment layer of the iris, which was turned out around the entire pupil, that did not involve the sphincter. There were delicate, spindle-shaped, radiating opacities in the anterior layers of the lens. The left fundus was lighter than the right.

Injury of the right eye of a boy eighteen years old by a blow of a fist. Two superficial lacerations close together in the upper-outer part of the margin of the dilated pupil. Slight opacity of the superficial part of the lens in the region of the pupil. Fundus hazy.

Ruptures of the iris after injuries of the eye may be found much more frequently by careful examinations than would be supposed from the number of cases reported.

We have tabulated the reported cases in order to ascertain, if possible, the mechanism by which these injuries to the iris are produced. From this table we learn first that in almost all cases the traumatism to the eye was very violent,

sufficient to produce serious lesions of the deeper parts of the eyeball as well as superficial injuries of the lids, conjunctiva, and cornea. The injuries of the iris were uncomplicated in only seven out of the thirty-nine cases. In ten the lens was dislocated, in fifteen the lens was cataractous, in thirteen there were hemorrhages into the vitreous, and in sixteen there were ruptures of the choroid or lesions of the retina.

As to the direction from which the violence was applied to the eye nothing is known except in a few cases. With the single exception of Blumenstock's case, in which a stone struck the supraorbital region, it always fell directly upon the eye. Whether the direction of the force, or the place where the blow fell, can be determined, depends in the first place on the nature and size of the object with which the injury was inflicted. It would scarcely be possible to determine the exact point of impact of a clenched fist on account of its uneven and irregular surface, but, on the contrary, it would be easy with an arrow. The nature and position of the injuries to the lids, conjunctiva, cornea, and sclera sometimes are of assistance as in our second case, where the conjunctival wounds showed clearly that the arrow struck on the nasal side. No conclusion, on the contrary, can be drawn from a large abrasion of the cornea, as that might be caused by a grazing blow. Only direct injuries of the cornea and sclera are of value for this purpose, not ruptures from bursting. The direction in which the lens is dislocated may sometimes be a guide to the place of impact. Exact information as to the position of the person at the moment of injury is also of great help in many cases.

In the cases in which it was possible to tell the direction from which the blow came, the ruptures of the iris were on the **opposite side** *from the place of impact.* Franke tried to explain the situation of the injuries in the pupillary margin in the following way. The first result of a severe blow on the eye is a reflex contraction of the sphincter of the iris, the second a flattening of the eyeball, which causes an enlargement of the insertion of the iris at the corneo-scleral ring, and, unless the pupil dilates again at the same time, the

force of the blow will be expended on its margin so as to cause one or more radiating ruptures.

It is questionable whether a traumatism causes a spastic contraction of the sphincter. A contraction of the pupil can be seen shortly after many severe contusions of the eye. Light blows on the eyes of rabbits do not cause contraction. Perhaps Clark's observation indicates a reflex myosis. In his case the ruptures of the iris and the lenticular opacity were covered when the pupil was contracted, a condition which may show that the pupil was contracted at the moment when the injury was received, but it is not proven that the blow caused the contraction.

Schirmer (15) disputed Franke's theory and sought to show that the opposing action of the contraction of the sphincter and the dilatation of the insertion of the iris by the pressure of the aqueous could not produce a radiating rupture, but only one running concentrically to the pupil. He thought that the cornea was bent inward so as to compress the iris at a certain point between itself and the lens, which could not be forced backward on account of the vitreous, and then as the rest of the iris was forced by the pressure of the aqueous to pull away from the portion thus held fast, lacerations would be produced. It has not yet been demonstrated that the central part of the cornea can be bent so far inward as to compress the iris between itself and the lens, unless the globe is flattened, though it might possibly happen in its peripheral part. But how are the four cases in which the ruptures occurred in the part of the iris opposite to the place where the blow was received to be explained by this theory? According to Schirmer, the tear or perforation must happen at or near the place where the iris is held fast. This theory also does not explain the cases in which the traumatism fell on the margin of the cornea, as in our second case, or farther back on the sclera.

In these cases the traumatism flattens the globe and so produces an enlargement of the corneo-scleral ring, while the greatest lacerations take place above and below when the force is applied laterally. The vertical diameter of the eye is increased, while the horizontal is diminished. The

iris and its sphincter participate in this movement so as to give the pupil a more oval form. The sphincter is stretched most severely at the points perpendicular to the direction of the applied force, and here the ruptures occur, unless preceded by an iridodialysis. Whether the iris tissue gives way at the periphery, the pupillary margin, or between these points, depends on its relative strength at these places. It can be shown that the pupil can be displaced by pressure from pressing gently on the corneo-scleral margin, when the corresponding part of the iris will be seen to be pushed toward the centre and the form of the pupil to be changed.

The elasticity of the sphincter must play a part. If a spastic contraction occurs, as Franke claims, it will cause greater resistance to an eventual stretching and furnish a point from which the force can act. Then lacerations can be made more easily.

1. RUPTURES IN THE IRIS.

	Author.	Sex and Age.	Eye.	Injury by.	Iris.	Pupil.	Complications.	Accommodation.	Remarks.
1	Stellwag	—	L	Blow with a chain.	"Artificial pupil," which could be distinguished from one made by an operation only by the iris remaining at the ciliary margin.	—	Probably opacities of the vitreous.	—	Good vision finally.
2	Amédée, Paris	—	R	Kick of a horse.	Triangular perforation above the pupil.	Neither pupil nor perforation reacts to light.	Diplopia.	—	Pupillary margin caught in a corneal cicatrix.
3	Lawson	Male 44	L	Rebounding bullet.	A second pupil above the normal one separated by a small bridge of iris.	Upper margin paralyzed; lower reacted to light.	Hazy media.	—	
4	Schmidt	Male 30	R	Piece of wood.	Linear, vertical tear in temporal portion.	Atropine dilated pupil, which remained round.	Hyphæma.	—	Only a slight scar in iris finally.
5	Clark	Male	R	Rebounding rifle ball on nasal side.	Perforation in upper-inner part.	Little dilated. Reacted slowly to light.	Localized lenticular opacity. Rupture of choroid.	Reduced	
6	Westphal	Male	R	Blow with a foot-stool.	Numerous little radiating ruptures.	Ruptures disappear under eserine.	Paralysis of sphincter. Iridodonesis.	—	
7	Reber	Male 35	R	Piece of coal.	Rupture 4mm long, 1½mm from limbus.	Roundish but distorted. Fair reaction to light.	Hyphæma. Haziness of lower portion of cornea.	—	
8	Case 3	Male 13	L	Blow with a stick.	Iridodialysis. Four other tears.	oval, dilated, at first fixed.	Dislocation of lens. Cataract.	—	Later increase in the length of the eye.

2. RUPTURES OF THE SPHINCTER OF THE IRIS.

	Author.	Sex and Age.	Eye.	Injury by.	Iris.	Pupil.	Complications.	Accommodation.	Remarks.
1	Josenhaus	—	L	Severe blow with a piece of wood weighing 20 lbs.	Torn outward from the pupil in several places.	—	Hyphæma. Dislocation of lens into anterior chamber.	—	Complete amaurosis.
2	White Cooper	—	R	Severe blow.	Two fissures of the inner circle.	Widely dilated. Fixed.	Probably intraocular changes.	—	Pupil still rigid after two months. Vision bad.
3	White Cooper	—	R	A bull 6 months before.	Reduced to a narrow strip. Two fissures below.	Enormously dilated.	Probably intraocular changes.	—	Pupil smaller after ten months, somewhat movable after fifteen months.
4	White Cooper	—	L	A stone 11 weeks before.	Three fissures in lower margin of pupil.	Considerably dilated.	Probably intraocular changes.	—	
5	Blumenstock	—	—	A stone in supra-orbital region 6 days before.	Iridodialysis down and outward. Several little fissures in pupillary margin upward and outward.	Widely dilated. Pear-shaped. Drawn downward. Little reaction to light.	Wound in supra-orbital region. Iridodonesis. Hemorrhage into the vitreous. Papilla pale.	—	
6	Wecker	—	—	Branch of a tree.	Synechia of corner of tear to anterior capsule of lens.	Pear-shaped. No mydriasis.	—	—	
7	Hirschberg	—	—	—	Small rupture of pupillary margin.	Moderate mydriasis.	Detachment of the retina. Wound of sclera close to lateral margin of cornea.	Good	Moderate mydriasis permanent.
8	Meyerhöfer	—	L	Piece of wood.	Several deep ruptures. Pupil star-shaped.	Medium dilatation Oval. Scarcely any reaction to light. Atropine acted quickly, eserine not at all.	Abrasion of corneal epithelium. Rupture of choroid.	Jaeger No. 4 at 51".	
9	Vermyn	—	R	Piece of wood.	Triangular coloboma in inner margin.	Paralytic mydriasis. Reacted to light.	Hyphæma.	Reduced.	Reaction of pupil to light improved later.
10	Yvert	—	—	—	—	—	—	—	
11	Yvert	—	R	Shot 40 days before.	Torn at each end of the vertical diameter.	Oval. Posterior synechiæ.	Scars in lids and cornea. Cataract. Eye small and soft.	—	Field contracted for white and colors.
12	Williams	—	—	—	Rupture of sphincter.	—	—	—	
13	Wadsworth	—	R	A stone.	Sphincter torn in 5 places.	Paralytic mydriasis.	Abrasion of the cornea. Vitreous opacities. Hyphæma.	—	Cataract later.

	Author.	Sex and Age.	Eye.	Injury by.	Iris.	Pupil.	Complications.	Accommodation.	Remarks.
14	Gallinga	—	L	Blow of a fist.	Iridodialysis above. Double laceration of the sphincter, one at each end of the iridodialysis, involving about ⅓ the breadth of the iris.	—	Subconjunctival luxation of the lens upward and inward.	—	
15	Franke	—	—	A piece of iron.	Eight tears in the nasal margin of the pupil; the two farthest apart nearly vertically opposite each other.	Atropine caused some dilatation by widening the pupil nasally and downward.	Corneal wound in outer quadrant. Opacities in lens. Two ruptures of the choroid.	Jaeger No. 18 with difficulty.	
16	Franke	—	—	A piece of steel.	Three fissures of the sphincter, 1 to 1½ *mm* long, in upper-outer part.	Good reaction to light, less perhaps, on the nasal side.	Wound of conjunctiva below and to nasal side.	—	
17	Franke	—	—	Blow of a stick.	Two small ruptures of outer margin of the sphincter.	Considerable mydriasis.	Eight radiations at posterior pole of lens. Haziness of anterior capsule.	Paralyzed.	
18	Pfalz	Male 8	L	A stone.	Two deep fissures of the sphincter in the upper part, with several superficial notches.	Dilated almost ad maximum, especially in upper part.	Wound at left internal canthus. Groove in cornea and sclera running downward and outward. Hyphæma. Vitreous opacities. Retinal changes.	Good.	Pupil remains moderately dilated. Reaction to light prompt in lower portion.
19	Blank	—	—	Fall on a door knob.	Three ruptures upward and downward on temporal side.	Moderately dilated.	Abrasion of cornea. Hyphæma. Luxation of lens nasally.	—	Cataract later.
20	Pohlenz	—	R	Blow of a stick.	Rupture of temporal margin of pupil and a perforation.	Atropine caused only nasal retraction of the pupil.	Abrasion of temporal side of cornea. Luxation and opacity of lens. Chorio-retinitis.	—	
21	Pohlenz	—	R	Blow of a stick.	Small tear in temporal margin of the pupil. Coloboma of the pigment epithelium.	At first very contracted and adherent. Atropine caused marked retraction, temporally and nasally.	Chorio-retinitis.	—	

	Author.	Sex and Age.	Eye.	Injury by.	Iris.	Pupil.	Complications.	Accommodation.	Remarks.
22	Harlan	Male 51	R	Blow with a chair 20 hours before.	Rupture in temporal margin of pupil. Numerous notches. Little radiating ruptures in tissue of iris.	Irregularly dilated and fixed. Eserine produced contraction.	Wound in temporal portion of brow.	$\frac{1}{10}$. ($\frac{1}{18}$ in the sound eye.)	No reaction of the pupil to light after the lapse of some time
23	Harlan	Male 40	R	A piece of stone 10 days before.	Small ruptures in margin of pupil.	Irregularly dilated. Contracted by eserine.	—	Reduced.	
24	Harlan	Male 14	L	Corn-shovel 4 hours before.	Three small ruptures in lower margin of pupil.	Dilated and fixed. Eserine of little effect.	Opacity of both corneæ. Fundus hazy. Rupture of choroid.	Same as in the other eye.	Reaction to light of the upper and lateral margins of the pupil later.
25	Harlan	Male 8	R	Stick of wood 4 days before.	Discolored. Ruptures down and in, and up and out, with several small ones between.	Dilated and fixed.	Abrasion of cornea. Hyphæma. Hemorrhage into vitreous. Rupture of choroid. Opacities of lens.	—	Eserine did not work well two years later. Some light reflex.
26	Harlan	Male 62	R	Stick of wood 3 days before.	Two ruptures of the circular fibres of the iris, running down and out. The piece of iris between them turned back.	—	Slight opacities of lens and vitreous. Vision = fingers at 43*cm*.	Same as in the other eye.	
27	Harlan	Male 26	R	Piece of cardboard 3 hours before.	Two slight ruptures in the lower, fixed margin. Eight small radiating ruptures.	Oval and dilated. Reacted to light.	Haziness of cornea and lens. Partial rupture of choroid.	—	Mydriasis and reaction to light permanent.
28	Kazaurow	Female 11	—	Blow with a stick.	Two widely gaping ruptures through the entire thickness.	—	Wound of the palpebral conjunctiva.	—	
29	Eversbusch	Male	—	Blow with a fist.	Six or eight little ruptures of the sphincter.	—	Hyphæma. Lenticular opacity.	—	
30	Case 1	Male 29	L	A piece of wood.	Rupture of sphincter above, with several smaller ones.	Irregularly dilated and fixed	Central abrasion of cornea. Hyphæma. Partial opacity of lens.	Same as in the other eye.	Moderate mydriasis. Reaction to light rather slow. Eserine produced contraction.
31	Case 2	Male 13	R	Rifle-shot.	Two ruptures of the sphincter, above and below, opposite each other.	Nearly round, dilated, and fixed. Myotics at first caused dilatation, later contraction.	Hyphæma, luxation of the lens, wounds in the nasal ocular conjunctiva. Hemorrhage into the vitreous. Rupture of the choroid.	Reduced.	Myopia, moderate dilatation of the roundish pupil. Slow reaction to light.

Yet lacerations can occur without a spastic contraction if the sphincter is stretched beyond its physiological limit. Fuchs tries to explain the rupture of the sphincter by the excessive stretching to which it is subjected by pressure of the backward driven aqueous. But this theory does not explain the cases in which the rupture of the iris is on the opposite side from the place of impact. There is not much difference between the theories of Fuchs and of Franke with regard to the behavior of the sphincter, for each is based on its over-distension.

There remains to be considered the action of the pupil when the sphincter of the iris has been injured.

The condition of the pupil was mentioned in 24 cases. In 11 of these it was very widely dilated, in 8 moderately dilated, and in 3 it was oval with synechiæ. In both of Wecker's cases the pupil was pear-shaped and the point of the rupture was attached to the posterior capsule of the lens. Once the pupil was much contracted and adherent. This was four days after the injury in an untreated, badly inflamed eye. Aside from deformation of the pupil by very large ruptures, dilatation is the rule. The gaping of rather large ruptures increases somewhat its size. The pupil is usually paralyzed. In 8 out of 13 cases it did not react to light, in 2 the reaction was sluggish, in 3 it was good. Unfortunately observations in regard to this were not made in the other cases. In some the reaction returned after a very long time, but it was then usually slower than that of the uninjured pupil. A partial restoration has also been observed in which the uninjured portion of the margin of the pupil reacted to light, while at the site of the rupture no motion, or only a slow one, could be observed, although no synechiæ were present.

Atropine was of service in Meyerhoefer's and Franke's cases. Pohlenz found that the injured portion of the pupil was influenced less than the rest by atropine, a fact which he explained by assuming a laceration of the fibres of the dilator simultaneously with the sphincter.

Eserine had no influence in Meyerhoefer's case, and but little in Harlan's two cases. In both of our cases it pro-

duced contraction, although in one it caused dilatation at first.

The tension was permanently reduced in Clark's, Vermyn's, and two of Harlan's cases, as well as in our first case. The accommodation was completely paralyzed in one of Franke's cases. It was the same as that of the uninjured eye in Hirschberg's, Pfalz's, two of Harlan's, and our own second case. Meyerhoefer claimed that myopia was caused by multiple ruptures of the sphincter, which was brought back to emmetropia by atropine. The case was probably one of spasm of the accommodation.

Explanation of the Figures on Plate XIV.

Fig. 1 (Case 1).—*a*, Notch of the upper margin of the pupil, bridged over by a delicate thread. Triangular superficial laceration above.

b, *c*, Concavities of the margin of the pupil. At *c* the pigment layer of the iris can be seen. Delicate gray opacity of the lens containing two small white spots.

Fig. 2 (Case 2).—*a*, Quadrilateral defect in the pupillary part of the iris, through which pass two fine gray threads.

b, Shallow notch of the pupillary margin. (A healed rupture.)

c, Old corneal leucoma.

Fig. 3.—Field of vision. (Case 2.)

Field for white_____

Field for blue _____

Field for red .....

The black spot represents the scotoma for white, about which is a zone in which white is not clear.

The scotoma for red is somewhat smaller than for blue below.

The scotoma for blue is larger than that for white.

LITERATURE.

1. FRANKE, E., Ueber Risse des Sphincter Iridis nebst Bemerkungen über die Mechanik des Aderhautrisses, *Graefe's Archiv*, xxxii., 2, 1886.

2. FRANKE, E., Nachtrag zur Kasuistik der Risse des Sphincter Iridis, *Graefe's Archiv*, xxxiii., 1, 1887.

3. PFALZ, G., Beiträge zur Kasuistik der Verletzungen, *Klin. Monatsbl. f. Augenheilk.*, 1887.

4. BLANK. Fall von dreifacher Ruptur der Iris, *Inaug.-Dissert.*, Greifswald, 1889.

5. POHLENZ, E. Ueber Risse des Sphincter Iridis und der Choroidea, *Inaug.-Dissert.*, Halle a. d. Saale, 1891.

6. HARLAN, Rupture of the Iris, *Transactions of the Amer. Ophth. Soc.*, 1896.

7. SCHMIDT, L., Zur Kasuistik der Regenbogenhautverletzungen, *Medizinskoje Obozrenze*, xxxi., No. 5.

8. WESTPHAL, Ein Fall von multiplen Einrissen der Regenbogenhaut zwischen Pupillar- und Ciliarrand, *Klin. Monatsbl. f. Augenheilk.*, 1896, 201.

9. REBER, W., Isolirte Ruptur der Iris ohne Verletzung der Augenhäute, *Arch. f. Augenheilk.*, xxxiv., p. 252.

10. CLARK, Rupture of Iris and Choroid from a Rebounding Rifle-Ball, ARCH. OF OPHTH., xviii., p. 12.

11. SOCOR, Lesions traumatiques rares de l'œil, *Bulletin société méd. et nat. de Jassy*, No. 3.

12. KAZAUROW, A., Ein Fall von Ruptur des Sphincter Iridis, *Westnik ophth.*, ii., p. 132, 1892.

13. BOUMA, D., Ueber 2 Fälle von radiärer Einreissung des Pigmentblattes der Iris, ihre Diagnose und Entstehung, *Klin. Monatsbl. f. Augenheilk.*, 1893, p. 381.

14. GINSBERG, Ophth. Beobachtungen, *Westnik ophth.*, x., p. 360, 1893. Double rupture of the iris from a blow with a fist.

15. SCHIRMER, Ueber indirecte Verletzungen der vorderen Linsenkapsel und der Sphincter Iridis, *Klin. Monatsbl. f. Augenheilk.*, 1890, p. 161

16. PRAUN, *Die Verletzungen d. Auges*, 1899, Wiesbaden.

ABSTRACTS OF ARTICLES IN VOL. XXXVIII. OF THE GERMAN EDITION, NOT PREVIOUSLY TRANSLATED.

By Dr. MATTHIAS LANCKTON FOSTER.

I.—Filtration through the Iris, Choroid, and Capsule of the Lens.

By Prof. **KOSTER-GZN**, of Leyden.

In reply to Ulrich's criticism of the author's paper, in which he gave the results of his experiments to determine whether fluids could filter from the posterior to the anterior chamber, a counter criticism of Ulrich's experiments is made. Some of the latter showed that under a pressure of 20*mm* of mercury a 75 % salt solution did not pass through fresh pieces of iris and choroid during the first quarter of an hour, but did pass through during the second quarter. The cause of this change is apparently the giving way of the tissue to the pressure, but in the eye there is no measurable difference in the pressure in the vitreous and in the anterior chamber. The success of the experiments with solutions of fluorescin, with which Ulrich thought he had proved the possibility of filtration through the iris, is ascribed to the chemical action of the fluorescin on the tissue, and is held to be inconclusive as to the conditions in the living eye. Hence the author considers that these experiments proved nothing.

II.—Pupillary Movements.

By Prof. **L. LAQUEUR**, of Strassburg.

The best-known movement of the pupil is the reaction caused by the entrance of light into the eye. The pupil at

first contracts considerably and then assumes a size proportioned to the intensity of the light.

The movement in response to the influence of mydriatics and myotics is different. After physostigmine has been instilled, there are for several minutes restless movements of the pupil and then a marked contraction. This is shortly followed by a relaxation, a more energetic contraction, another relaxation, and so on until the maximum myosis has been attained, when the restless movements of the pupil are still noticeable.

A short time after atropine or homatropine has been instilled, the pupil begins to dilate and to show some restless movements, but never a noticeable contraction. The dilatation proceeds gradually and almost continuously, the restless movements becoming fewer, until it is complete and the pupil immovable.

The action of both myotics and mydriatics on the ciliary muscle is similar to that on the pupil.

When the pupil passes from contraction to dilatation the posterior pigment layer of the iris is affected more than the anterior layer. A metallic lustre of the iris is lost in complete dilatation of the pupil, because the endothelial cells override each other, but when such a lustre is not present the movements of the pupil cause no change in the appearance of the iris, or in its anterior surface, except in area. In complete dilatation, the sphincteric portion is folded in and presents a groove with its concavity directed toward the centre of the pupil. The minor circle of the iris seems to bound the pupil, but in reality it simply covers the sphincteric portion, so the latter can be seen only by looking at it from the side.

The excursions of the sphincter of the pupil are very great. The pupil can be contracted by physostigmine to a diameter of 1*mm*, and enlarged by atropine to a diameter of 8 or 9*mm*—*i. e.*, the innermost layer of muscle fibres of the sphincter has at one time a length of 3*mm* and at another time one of 28*mm*. The physiological variation in the size of the pupil is from 2 to 8*mm*. This great contractility is not lessened even though the muscle has been kept at its

maximum length for months. The size of the pupil at any given time depends on the equilibrium maintained between the sphincter of the iris and the dilator of the pupil, very slightly on the amount of blood in the tissue, which has erroneously been thought to be of more importance. Each muscular contraction is accompanied by an independent relaxation of the antagonistic muscle. The contraction of the pupil is produced by the individual contraction of the fibre cells, rather than of the circular fibres as a whole, because if it depended on the latter contraction would be impossible whenever there was a solution of continuity of the sphincter from any cause whatever, while it is well known that such is not the case. Any portion of the margin of the pupil can contract by itself, and there is no fixed point for its movements. This is shown by the fact that reaction to light can be plainly seen when most of the margin of the pupil is held fast by almost total posterior synechiæ, or large adherent leucomas, so that only a very small portion is free.

The author has observed a peculiar condition of the iris, which he believes has never before been described, in six cases of iridectomy, during the operation. To this condition he has given the name tetanus of the sphincter. After the iris has been seized by the forceps and a portion removed with the scissors, there appears to be at first no defect in the iris, or at most only a fine dark line in the membrane perpendicular to the wound in the corneo-scleral margin. After a minute this line begins to broaden gradually, until, at the end of from three to five minutes, it has attained the breadth of the excised piece of iris. This phenomenon must be due to a spastic contraction of the neighboring parts of the iris, of sufficient strength to bring together the margins of the coloboma. It is probably caused by the seizure in the forceps of an iris whose nerves have been rendered unusually irritable by a previous inflammation, for in none of the cases was the iris normal. In one case the patient was under the influence of chloroform.

Excentric position of the pupil does not interfere with the action of the sphincter, but an iridodialysis renders the corresponding part of the margin of the pupil paralyzed.

Recent investigations have shown that the sphincter is innervated by the sympathetic through the ciliary ganglion, where it is indirectly influenced by the oculomotorius, so the sphincter of the pupil and the ciliary muscle are no longer supposed to occupy the exceptional position of being the only unstriped muscles in the body innervated by a motor nerve, but this makes the explanation of the action of mydriatics more difficult.

It is commonly assumed that the pupil contracts to prevent the eye being dazzled by too much light. This is true to a certain extent, for when mydriasis happens suddenly in a normal eye dazzling occurs, but it soon passes off and patients with large artificial colobomas, or with total irideræmia, do not complain of it. The contraction of the pupil increases the sharpness of definition of the retinal images, and so the acuteness of vision. In some aphakic eyes it sometimes simulates a retention of the power of accommodation.

III.—Blindness of both Eyes Caused by a Rifle Shot.

By Dr. **HABERKAMP**, of Bochum.

A young man was shot in the right malar region near the orbit. The bullet passed through the right eye, the nasal cavity in the olfactory region, and finally entered the left orbit, where it is supposed that it struck the left eyeball a violent blow, as its retina was found to be totally detached.

IV.—The Embryology of the Crystalline Lens in Frogs.

By Dr. **C. RITTER.**

This rather long article on a subject in comparative embryology cannot easily be condensed so as to form a satisfactory abstract. A perusal of the original will repay any one interested in the subject.

SARCOMA OF THE ORBIT. REPORT OF A CASE CURED BY THE X-RAY.

By L. WEBSTER FOX, A.M., M.D.,

PROFESSOR OF OPHTHALMOLOGY, MEDICO-CHIRURGICAL COLLEGE, PHILADELPHIA, PA.

(*With 3 figures on Text-Plate I.*)

WITH the advance in radiotherapy, and with the perfecting of its technic, the cases to which it is applicable become more numerous. The value of the X-ray in superficial epithelioma, lupus vulgaris, and similar diseases, is no longer a matter of conjecture and has received due recognition from all sources. The results attending its use in wholly or partially concealed morbid growths, on the other hand, are extremely variable, but warrant a fair trial in all cases. The case I wish to report in this connection is one of sarcoma of the orbit, in which the judicious employment of X-rays resulted in a cure of the condition with restoration to health.

The patient, a young Jewess, twenty years of age, consulted me, March 5, 1903, complaining of enlargement of the left naso-orbital region. The duration of the condition was then about six weeks, and the growth was progressing. Proptosis was present and the upper lid could only be raised by extreme effort. The tension of the globe was apparently normal. Pain was experienced, but was not severe in character. Vision was normal ($\frac{6}{6}$) in both eyes. The fields were not contracted. Diplopia was present only when an attempt was made to perform near work. The upper eyelid was distended and was markedly chemosed, and the conjunctiva protruded between the eyelids. Palpation showed the growth to be separated from the globe and attached to the

bony wall of the orbit. The diagnosis of malignant growth, probably sarcoma, was made at this time by Professors Rodman and Laplace, members of the hospital staff. To the touch it appeared about the size and shape of a large olive. The patient was placed upon large doses of iodide and bromide of potassium (20 grains three times daily). Owing to the extreme nervous phenomena developing at this stage of the disease, Dr. F. Savary Pearce, Professor of Nervous Diseases to the Medico-Chirurgical College, was called to see the case. His report to me states that on April 6, 1903, he noticed that there were very marked tonic spasms of the flexor muscles of the left hand and forearm. With this the thumbs were adducted and pressed against the forefingers, producing the writing posture, or so-called "accoucheur's hand." The upper arms were firmly adducted; the toes were strongly flexed, the knees and feet being extended. There was but little trismus. The patient's mental condition was clear. Trousseau's and Chevostek's signs were present. April 10th, tetanoid symptoms had entirely disappeared. April 18th, the patient had been free from spasms for over a week, although extremely nervous. The abatement of tetany was, no doubt, due to the influence of the bromide and morphine which were given to control the muscular contractions when most marked and painful.

It would seem that in this case of sarcoma of the orbit irritation of the cortex of the cerebrum had occurred, producing irritative symptoms, and hence the transient tetany, which soon disappeared when orbital pressure was relieved and the toxines from the involved growth were better eliminated.

Dr. Walter J. Freeman, of the Polyclinic, also made a careful examination of the antrum and orbit with electric light. From the shadow thrown around the eyeball and in the orbit, his diagnosis was either pus or new growth in the orbit.

Two weeks later, in order to render the findings of Dr. Freeman's examination more positive, an exploratory incision over this growth, beneath the supraorbital ridge, and continued to the base of the nose, was advised. In consultation with my colleague, Dr. E. B. Gleason, the condition of the antrum of Highmore was again investigated by transillumination. With a small electric light inside the patient's mouth, the tissues over the left antrum were decidedly dark; those over the right antrum had the normal tint reflex. It was decided to make an exploratory punc-

ture into the left antrum preliminary to the more serious operation of opening the orbit and destroying the ethmoid cells should they prove to be filled with pus. However, the exploratory puncture yielded negative results. In this connection it should be stated that by transillumination the tissues over the left antrum were thicker than those of the right. At any rate, the left antrum was entered only after passing through bone of greater density and thickness than usually encountered in the wall of an antrum of normal size.

After the exploratory puncture of the antrum had yielded negative results, Dr. Gleason made the usual incision through the skin at the inner canthus and elevated the periosteum over the anterior and middle ethmoid cells. In this locality a considerable amount of yellow glairy fluid escaped from the wound, evidently originating in diseased ethmoid cells, but no pus was found back of the eyeball, only infiltration of connective tissue. Although the diagnosis of a malignant orbital growth was rendered probable as the result of the incision, it was decided to establish free drainage into the nose by curetting away the diseased ethmoid cells. This was accordingly done, and the wound packed with iodoform gauze, which was removed daily and the wound cleansed by syringing through it into the nose. The result of the operation was an entire cessation of the pain from which the patient had previously suffered, but there was little or no diminution in the size of the swollen eyelids nor of the exophthalmus.

At the end of the week or ten days the wound was allowed to close. Soon afterwards, four or five days, a mass of granulations showed themselves in the wound, which were removed, together with a small section of skin and muscular tissue, and sent to Dr. Harold G. Goldberg for microscopical examination. The follow- is his report:

Clinical Diagnosis.—Sarcoma of the orbit (?).
Pathological Diagnosis.—Spindle-cell sarcoma.
Specimen skin from upper-inner angle of the orbit.
Date received, 6/4/03; date reported, 6/16/03.

PATHOLOGICAL REPORT.

Stains.—Hæmatoxylin-eosin and Van Giesen's.

Microscopy.—Tissues very vascular and densely infiltrated with polynuclear leucocytes, partially obscuring the sarcoma ele-

ments, which are of the spindle-cell variety and have invaded the tissues at different levels of the corium, inflammatory tissues intervening.

The eyelids continued to protrude very markedly and the patient's general health began to fail in spite of the treatment which was continued throughout. While an operation for the removal of the growth seemed inevitable, it was not deemed advisable, upon taking into consideration all the facts of the case, and particularly the subsequent course of this class of affections. The appearance presented by the patient at this time is fairly well shown in the accompanying illustration (Fig. 1).

In consultation with my surgical colleagues it was deemed an inoperable case. As a last resort I concluded that we would place the patient under the supervision of Dr. George E. Pfahler, who has charge of the X-ray department at the Medico-Chirurgical Hospital. The first treatment was applied May 25, 1903. During the following four weeks twenty-eight applications were made, or about one a day for five minutes each, with a high vacuum tube at a distance of ten inches and a current of four amperes. A reduction of the swelling was noted and it was deemed expedient to lessen the X-ray.

The occurrence of excessive erythema of the eyelids and the adjacent integument likewise indicated a reduction in the frequency of the applications after about the thirtieth application. The applications were then made three times a week for two weeks; this was reduced to two per week for one week, and afterwards one every week since July 15, 1903. The recent exposures (one per week) lasted ten minutes each. Altogether forty-six exposures have been made. At this time improvement was pronounced. The growth had diminished markedly in size and the eyeball had returned to its normal position, but the eyelids were still slightly swollen. This is well shown in Fig. 2.

By the continuance of the applications, once every two weeks, the return to normal was hastened, so that at present, November 21, 1903, the general condition is good and the symmetry of the facial expression has returned. There has been no pronounced burning or ulceration as the result of the treatment; there was, however, complete destruction of the eyelashes and eyebrows. The third illustration is presented to show the final result of the treatment (Fig. 3).

While this single case does not prove that X-ray treat-

FIG. 1.—Sarcoma of the Orbit. Before the application of the X-ray.

FIG. 2.—Sarcoma of the Orbit. After 3 months' treatment with the X-ray.

FIG. 3.—Showing final results of the treatment.

ment is capable of curing all such cases, it does show a possibility of bringing about a favorable result, the importance of which must not be ignored. Orbital growths are always more or less vague and unsatisfactory as regards treatment. The usual course of antisyphilitic remedies is but very occasionally of value, and in those cases in which operation is performed considerable mutilation is always necessary. If, then, the X-ray is endowed with properties such as have been shown by the report of the preceding and other cases, is it not advisable to consider it in all cases of this class before resorting to any surgical operation? The collection of a large number of cases so treated would answer this question positively, but until such a collection is made, isolated cases, such as the one just described, should demand consideration.

BIOGRAPHY OF HERMAN VON HELMHOLTZ, WITH PERSONAL RECOLLECTIONS.

By HERMAN KNAPP.[1]

THE father of Herman Ludwig Ferdinand von Helmholtz, August Ferdinand Julius Helmholtz, was born in 1792 in Berlin. He chose philology for his support, participated as voluntary chasseur in the campaign against Napoleon in 1813 and 1814, entered the philosophical faculty of the Berlin University in 1815, and was called as a teacher to the Gymnasium (Lyceum) in Potsdam, where he received the appointment as professor in 1828.

In October, 1820, he married Caroline Penne, the twenty-three-year-old daughter of a Hanoverian artillery officer, a direct descendant, in the male line, of William Penn, the founder of the State of Pennsylvania; in the female line, of a descendant of a French refugee family, by the name of Sauvage.

"Caroline (Penne) Helmholtz, the mother of Herman, was a plain, intelligent, and refined woman. Her speech was direct, her judgment clear; with a kind of divination, apparently without meditation, she quickly penetrated difficult problems to their remotest consequences, and expressed her opinion in the simplest form."

Helmholtz's father, distinguished by his knowledge of the ancient Roman and still more the Greek classics, was never-

[1] This short history of the life and work of Helmholtz is based chiefly on the excellent and exhaustive biography of Helmholtz by Leo Königsberger, Professor of Mathematics at the University of Heidelberg. See Book Reviews, vol. xxxii., of these ARCHIVES, p. 617. Sentences and paragraphs put in quotation marks without reference are verbal translations from Königsberger's work.

theless an enthusiastic admirer of the German poetical literature, and a patriot in both body and soul.

Besides his literary prominence, he was noted for his proficiency in physics and mathematics, which branches he had to teach in the higher classes of the Potsdam Lyceum during the last five years of his life.

Herman L. F. Helmholtz, the eldest of five children, was born at Potsdam on August 21, 1821. He was baptized in the Lutheran Church. Homely and feeble in his early years, he was, like Alexander von Humboldt, not a precocious child, but after his eighth year he made good progress at school. Though his home-studies, penmanship, and arithmetical problems were unsatisfactory, his attention, zeal, wide-awake interest, and independent thinking were conspicuous. From the beginning, his weakness of memory for disconnected objects was prejudicial to him. Fifty years later, he said: "It was difficult for me to distinguish right from left. Later I had greater trouble than other scholars to commit to memory single words, irregular grammatical forms, and idiomatic expressions. History, as taught at that time, would scarcely get into my head; to learn by heart pieces of prose was martyrdom to me, whereas good poems were very easy. This defect has, of course, increased and become the annoyance of my old age."

Helmholtz took the regular classical course at the Lyceum of Potsdam until his seventeenth year, when he passed his examination for the senior class (prima) with honor in Latin, Greek, Hebrew, Religion, Mathematics, and Physics. In the next term he **received in all his studies the degree "very good," and in mathematics and physics that of "excellent."**

At that time he expressed to his father his desire to devote himself to the study of the natural sciences, particularly to physics. His father replied that he could not see his way clear to make this possible for him unless he took medicine into the bargain. As the son agreed to that, the father obtained for him permission to apply for admission to the Military Medical School of Berlin, where students in modest circumstances received gratuitously a full medical

education, consisting in a course of four or five years, on the pledge to serve eight years as army surgeons without pay. When Helmholtz had obtained permission to undergo his entrance examination, the surgeon-general of the army received him very kindly and told him not to be afraid of the questions: if he could not answer them all correctly it would not matter, they were meant only to test his talents. This permission was, however, conditional to having passed the final examination at the Lyceum and received the certificate of maturity for professional studies at the university. He passed, and received a certificate favorable in the highest degree, testifying to his proficiency in an unusually extensive range of subjects, comprising several optional studies, besides the many required ones. The diploma further emphasized the **integrity and rectitude of his character and blamelessness of conduct**, grounded on his careful parental education, his mental endowments, and his predilection for scientific pursuits. He was fond of music, yet he never was a virtuoso, but even in the years of his greatest activity he used to play the scores of new operas or orchestral music before hearing them in theatres or concert halls.

On September 26, 1838, at the age of seventeen, H. Helmholtz left his father's domicil to enter, for five years, the Royal Medico-Chirurgical Frederic-Wilhelm Institute in Berlin. In this Institute ("The Pépinière") he took the regular course. Among his teachers the famous anatomist and physiologist, Johannes Müller, had the greatest influence on his future career.

In his twenty-first year Helmholtz handed him the manuscript of his Inaugural Dissertation. Müller received him kindly, and after he had let him state the plan and the main result of his researches and the conclusions drawn from them, he declared that the result was undoubtedly of great interest by demonstrating the origin of nerve-fibres in the invertebrates, which for higher animals might well be supposed, but it had not yet been possible to prove it. He advised him to extend his investigations over larger groups of animals, in order to impart to the result such stringently conclusive force as it could not claim by the examination of only three

or four species. He did that, and on the ground of his thesis **De Fabrica Systematis Nervosi Evertebratorum** and his successful examination, he received his M.D., November 2, 1842. The microscopic discovery of the origin of the nerve-fibres in the ganglion cells (these latter having been discovered by Ehrenberg in 1833) is universally considered by physiologists as the histological basis of the physiology and pathology of the entire nervous system. The connection of nerve-fibres with ganglion cells furnished the proof of the central nature of these cells, a fact the demonstration of which had been lacking until Helmholtz, in his twenty-second year, discovered it in the invertebrates by a microscopic investigation of the highest order.

The dominant influence which Joh. Müller had on Helmholtz in the Berlin Military Medical Institute was supplemented by that of two fellow-students, two years older than himself, the young physiologists **Brücke** and **Dubois-Reymond.** These three, joined not long after by **C. Ludwig,** inaugurated the modern German School of Physiology, called the Physical, which broke with the current speculative philosophical system, and based their investigations entirely on tangible demonstration by the exact methods of observation and experimentation as used in the natural sciences. Friendly intercourse with the great investigator, their teacher, Joh. Müller, taught them "how the ideas move in an independent head," elevating their lives and pursuits. Fifty years later Helmholtz said: "He that has once come in touch with men of the first rank finds his mental measure changed forever; apart from this, that touch is the greatest gratification life can offer."

Besides physics, Helmholtz, during his stay at the Pépinière, turned his attention also to chemistry. The "vital force" which in former years was thought indispensable in organic life was near dying. The phenomena of fermentation and putrefaction were the field of contention. Joh. Müller was perplexed by the new ideas, as the vital force seemed to him a necessary postulate for live processes until death, when it disappeared with the living substratum. Helmholtz found this idea paradoxical. To him it appeared

inconceivable that under any conditions force or matter simply disappeared, without leaving a trace of its former existence. He made experiments in the laboratory of Prof. Magnus; left the Pépinière October 1, 1843, as he had been appointed Squadron-Chirurgus of the Hussars of the Garde-du-Corps Regiment at Potsdam, a position which he held until 1848. It afforded him a good deal of leisure, which he used for his scientific pursuits. He studied Jacobi's *Fundamenta nova functionum ellipticarum;* his thumbed copy shows still to-day how much industry he devoted to this difficult subject. Father and son, now in close proximity, were not at all in harmony on philosophical questions: the father was a staunch advocate of the deductive method in solving such questions, whereas the son was averse to all metaphysical speculation, and at that time was unremittingly striving with hand and head to find substantial evidence of the law which controls the whole world, viz., the *persistence* or *conservation of energy.* Having to rely solely on his own exertion, he fitted out, in the barracks, a small physical laboratory for himself. Here he resorted to the "old martyrs of science, the frogs," and, with the help of a small electric apparatus, constructed by himself, and a Leyden jar, he made a series of experiments on the phenomena produced by the action of muscles, always with a view to acquire further evidence in support of this all-important law of nature. He found that muscular action was accompanied by a chemical change and a liberation of heat, a fact warranting the conclusion that the substances which by respiration and digestion are brought into the body account, by their chemical combinations, for the sum-total of animal heat. From this conclusion he derived the general inference that the sum-total of force in the world must be as constant as the sum-total of matter, the persistence of which had been demonstrated by Lavoisier in the second half of the eighteenth century.

In October, 1845, he received a furlough of six months to take his medical state examination in Berlin. This took five months of greatest exertion. He received the degree "very good" (the highest), both in medicine and surgery, but not the title of "operator." In his twenty-sixth year

he made the acquaintance of his first wife, **Olga von Velten.** Her grandfather, Cornet Velten, of the Ziethen-Hussars, rescued, with the Horse Captain von Prittwitz, in the battle of Kunersdorf, the king whom, in the retreat of the army, he saw standing alone on a hill, his sword stuck in the ground before him, in danger of death or capture. Velten, with Prittwitz, beat his way through to the king and secured his escape by letting him mount his own horse. The king rewarded this brave action by bestowing on him a patent of nobility and the order *pour le mérite.* Frau von Velten, a widow, had two daughters, Olga being the younger. After the death of her husband she settled in Potsdam, where her brother was an army surgeon of high rank. He introduced the three distinguished ladies into prominent families. Young Helmholtz soon obtained access to their house, "at the beginning as a somewhat strange guest." "Very serious and reserved," writes his sister-in-law; "somewhat awkward among the lively young men of Potsdam society. After the introduction his friend said: 'A very bright fellow, but you must first excavate him'; and indeed we found in him a mine of treasures." Helmholtz and the younger daughter soon were charmed with each other. The engagement took place March 11, 1847, but the marriage had to be postponed until Helmholtz had a fixed position. During that time he was intensely occupied with his studies on the *conservation of force.* In February, 1847, he sent an introduction to a later publication in MS. to Prof. DUBOIS-REYMOND, asking the kindness of his criticism and advice in making changes. Dubois received it with enthusiasm: the *introduction* should go to print unchanged *as an historical document of great scientific conception for all time.*

July 23, 1847, he read a paper on his "Persistence of Force" in the Berlin Physical Society. "He made this sitting the most memorable in the Society's annals, and manifested himself forthwith as a physico-mathematician capable of solving any problem. The Berlin Physical Society first recognized the law of the conservation of force at a time when the whole world did not think much of it."

Immediately after the session, Helmholtz sent the MS. to MAGNUS with the request to secure its publication in POGGENDORFF's *Annalen.* Neither Magnus nor Poggendorff liked the mathematical presentation of experimental investigation of physical problems, and the editor of the *Annalen* refused the acceptance of Helmholtz's paper. "The introduction constituted in its contents the program of the modern research in natural science of the second half of the nineteenth century; also the simplicity and elegance of the form manifested the master of language."[1] "It is evident," he says, "that the notions of matter and force, applied to nature, must never be separated. Pure matter would be indifferent to the rest of nature, because it could not occasion a change in it or an impression on our sense-organs; mere force would be something that exists, and, again, does not exist, because we call matter that which exists. Just as wrongly would we declare matter to be something real, and force a mere notion to which nothing real would respond; both are reciprocal abstractions of what exists, for we can conceive matter only by its forces, not by itself. Matter with unchangeable forces (indestructible qualities) is called in chemistry an element. If we imagine the universe composed of elements with inalterable qualities, the only changes possible in such a system would be those that relate to space, *i. e.*, forces of motion. The final object of the physical sciences of nature is to reduce the natural phenomena to inalterable attractive and repulsive forces the intensity of which depends on their distance. The solvableness of this problem is the condition of the complete conceivableness of nature. . . . Theoretical Natural Science, if not stopping half-way, will have to harmonize her opinions with the stated postulates on the nature of the single forces and their consequences. Its business will be accomplished when she has succeeded in deducing the phenomena from single forces, and in demonstrating at the same time that her deduction is the only one which the phenomena warrant. This would be the requisite intellectual expres-

[1] Published in full by Leo Königsberger: *Helmholtz-Biographie*, vol i., p. 72, etc

sion of the conception of nature, to which then also objective truth would have to be accorded."

Helmholtz offered his manuscript on the "**Erhaltung der Kraft**" (**Persistence of Force**), after it had been declined by Poggendorff's *Annalen*, to G. A. Reimer for publication as an independent monograph. To show his fitness for such work he referred to Professors Magnus, J. Müller, and Dubois-Reymond, and also to his previous papers: (1) his dissertation on the "Nervous System of the Invertebrates"; (2) on the "Character of Putrefaction and Fermentation," Müller's *Arch. für Physiologie*, 1843, p. 451; (3) on the "Consumption of Matter during Muscular Action," *Ibid.* 1845, p. 52; (4) an article on "Animal Heat," *Encyclopedic Lexicon of the Medical Sciences*, published by the Medical Faculty of the University of Berlin. Mr. Reimer published the monograph and paid the author liberally, which, at that time, was a welcome surprise to the young man. The monograph was generally admired, though it roused on the one side a great deal of opposition to its far-reaching statements and ideas, and on the other much controversy as to its priority, which we need not consider here. Suffice it to say that large questions do not rise, nor are they solved, in one year. They are prepared years before and by many simultaneous pioneers whose names do not always figure in literature. At last one with a keen intellect, broad education, persistent working-power, and favorable surroundings grasps the question in its broad extent and clears the field step by step. Such was the condition when Helmholtz took up this great question, which in importance is second only to the demonstration of the *persistence of matter in the universe* by Lavoisier. He conscientiously accorded priority to the work of his predecessors, the English physicist JOULE, the German physician, Dr. J. ROB. MAYER of Heilbronn, and the great mathematician, JOH. JAC. JACOBI of Königsberg; but it remained for Helmholtz to carry the solution of this great question to its ultimate conclusion by purposeful and steady work in physico-chemical experimentation and mathematical presentation during several years. "Whereas he started with the thought of furnishing in his

article a critical investigation and bringing order into the facts thus far known in the interest of physiologists, and whereas he expected from physicists at the most the censure that he (a young physician) would present to them old things as new, the opposition on all sides convinced him that he had clearly expressed, for the first time, a far-reaching principle of natural philosophy and divested it from all indefinite philosophical and speculative reflections." When he began his medical studies in 1841, inorganic nature was governed altogether by the laws of physics and chemistry, but organic nature required more,—the vital force. His experiments on muscles, etc., dispersed the last shadow of doubt that in the whole of nature no force can be created, none destroyed. A vital force is just as little called for in organic processes as perpetual motion in physical machinery. The experimental demonstration that all force in organic nature is accounted for by the chemico-physical reactions of ingesta through respiration and nutrition, was the last missing link for the general law of the universe: an eternal and indestructible quantity of force as well as of matter governs the whole.

In the summer of 1848, Helmholtz was appointed teacher of anatomy at the Academy of Art and assistant to the Anatomo-Zoötomic Museum of Berlin with an annual salary of 600 Thalers. This implied the release from the remaining three years of service as an army physician and surgeon to which he was pledged. He was so conscientious in the service of his new charge that he had but little time for the pursuit of scientific research. Fortunately his present position lasted only one year, when he was appointed successor to Brücke in the extraordinary professorship of physiology at Königsberg, with a salary of 800 Thalers, Brücke having accepted a call to Vienna.

Being now financially in a satisfactory condition, he saw that the time had come to inaugurate his domestic happiness. After an engagement of two and a half years he married his *fiancée* August 26, 1849, at Dahlem, near Berlin, in the house of his sister-in-law. The young couple settled in Königsberg. Helmholtz took up again his researches on

muscle-action, in which his wife assisted him diligently, as is attested by the records of many series of experiments preserved in his posthumous papers. His investigations proved that muscles lose their power faster when in motion than in rest, *i. e.*, exactly as in electrodynamic processes the effected motion weakens the causative force.

His next investigation was the determination of the **velocity of the nerve-current.** He found that the time between the momentary electrical excitation of the thigh of a large frog was followed by a contraction of the muscles of the calf of the leg in 0.0014–0.0020 of a second, of which the velocity of the nerve-current was computed to be 50–60 *m* a second. To carry out these experiments, he needed apparatus with which to *measure smallest intervals of time* as we measure with the microscope smallest intervals of space. For this purpose he constructed an apparatus with a rotating cylinder which yielded satisfactory results. This apparatus (myographion) added an important aid to finer physiological experiments. He also experimented on himself to measure what interval of time is necessary to conduct a cutaneous excitation from the toe to the brain, and how soon the resulting muscle-action occurs, which means how long a time is consumed by the centripetal and the centrifugal nerve-current together. He found the same velocity of the nerve-current as by his experiments on frogs. He published his investigations in Müller's *Archiv* in December, 1850, under the supervision of his friend Dubois, and in the same month he delivered a popular lecture at Königsberg on the "Method to Measure Smallest Intervals of Time, and its Application to Physiological Questions." At the end of his lecture, to make himself clear, he said: "If a respectable whale hurts his tail he will know it only in a second, and it takes another second to command the tail to defend itself."

Helmholtz and Dubois worked in the same field; they were the best of friends, free from the jealousy of ordinary men, frequently communicating their thoughts and experiments to each other.

On March 18, 1851, Dubois sent Helmholtz a popular

lecture which he had recently delivered in the Berlin "Sing-Academie" before "the well-known gathering of the classes that do not work," accompanied by a letter in which the following passages are significant: "Your surprise in reading my lecture will probably be not much less than mine in reading yours. It is found that in similes and in different other points, even in details of expression, we have met in such a way that no stranger will acquit me from the suspicion of plagiarism. To *me* this conformity in the movements of our brain-molecules is extremely flattering." Speaking of the difficulties he experiences in constructing certain apparatus he says: "Write me what avalanches of thought the sound of this mule-bell has roused."

Helmholtz, in a letter of congratulation on Dubois's election as a full member of the Academy, writes:

"In regard to the conformities in our lectures, I concede you the priority of the electric telegraphs, for a long time ago I heard you speak of the hypothesis that the ganglia represented the intermediate stations of the electric telegraphs of the nervous system."

"While Helmholtz was continuously and deeply occupied with these great and fundamental researches whose end was to prepare and establish a mechanistic conception of the universe in a higher sense, he succeeded, without great efforts, **in inventing the ophthalmoscope**, an instrument which to the ophthalmologist opened a new world, and this, with his researches on the **conservation of energy**, was his greatest triumph. The very useful obligation of every university professor to teach the whole contents of his branch of science so as to make it clear to the class, was, according to his testimony, the occasion of this invention. It was a ripe fruit, requiring no other knowledge of optics than what he had learned in the lyceum." The construction and importance of the ophthalmoscope are so well known that we need not dwell on them now; suffice it to say that it introduced a new era into one of the most useful branches of medicine and surgery, and among the instruments used in medicine the most useful not only for the eye but for the

whole body. The instrument is in every physician's hand and the additional discoveries made by its aid are still frequent and of great scientific and practical value. Helmholtz does not speak of it as something great, because its invention did not cost him the great efforts which were required in most of his previous researches. Yet it bears the stamp of almost every great invention—simplicity.

"For my standing before the world," he said, "the invention of the ophthalmoscope has been decisive. After it I found easy approval of my suggestions and assistance in my requests on the part of my superiors and colleagues, smoothing the path to my field of labor. Apart from this I think that I owe my success to the favorable chance that a man of geometrical mind and provided with knowledge in physics was thrown among physicians, where he found a virgin soil of great fertility, and, on the other hand, his knowledge of biology led to questions and view-points which ordinarily are unknown to mathematicians and natural philosphers." He made the first public announcement of the "eye-mirror" on November 11, 1850.

In the fall vacation he made a journey through Germany to visit the principal physiological institutes. He left wife and child at Dahlem with relatives, and "visited first Halle, then Göttingen, the little town whose centre of gravity is the University. He called on the professors, the aristocracy of the town; they showed their dignity and were a little inclined not to underrate the achievements of their own circle. The physiologist, R. WAGNER, an old man, is not quite up to the requisite physical knowledge; he knows it and is careful enough not to intrude. The eye-surgeon RUETE had made valuable contributions to the physiology of the eye."

Ruete replaced the plain glass-plates with which Helmholtz illuminated the eye, by the perforated concave mirror, which by its convenience and greater illuminative power has from that time on been in general use. His large demonstration ophthalmoscope, the first of that kind, was used in his ophthalmic clinic when the present writer was an attending student. It gave very fine pictures, but it usually

took half an hour to adjust it for the students. Ruete was the first scientifically to study the movements of the eye, using for that purpose the after-image cast from a straight light-line, a suggestion of the Hollander Hueck. He, as far as my memory serves me, constructed also the first, rather complicated, ophthalmotrope. "Among the Göttingen celebrities," Helmholtz mentioned in his letter "the mathematical optician LISTING, to whom my attention had not been drawn before." Listing's great merits in refraction and motility soon received general recognition. "After Göttingen, Helmholtz visited Marburg, where he called on the prominent physicist KNOBLAUCH, and the physiologist NASSE. From Marburg he went to Giessen in the hope of making the acquaintance of LIEBIG, the king of chemists—in his own opinion and that of his pupils. Unfortunately he was abroad, in London, to see the World's Fair (1851) and to be lionized by the English. His son—a young physician—showed Helmholtz through his laboratory which, at the time, was neglected and dirty, and not to be compared in size, arrangement, and equipment with that of Heintz and others. It is evident, that externals are not essential. In spite of all his vanity LIEBIG is the greatest chemist among the living, and as a teacher has exceedingly widespread influence."

From Giessen he went to Frankfurt a/M., where he admired again, in the picture gallery, LESSING'S Huss, Ezzelino, and two small landscapes. Thence he went to Heidelberg, where HENLE told him of the trouble of the medical faculty on account of the lack of teachers. In the continuation of his journey he visited Baden-Baden (for a few hours), "crossed the Rhine at Kehl, and entered the *République Française*, where he found a great deal to amuse him. *Propriété de la Nation*, on all public buildings; *Liberté, Fraternité, Égalité*, everywhere, even on many private residences, and terribly democratic devices. He admired the cathedral; "unfortunately it is greatly patched up; anything that is of Erwin von Steinbach is of the best one can see; also in the interior where he had to lean on older parts there are very imposing and noble structures."

After seeing the noble cathedral of Freiburg, he stops at the "World's wonder," the Rhine-Fall at Schaffhausen, which deeply impressed him. "The height of the cataract is sixty feet, the mass of water considerable; its silvery white surface, the foam, the changes of color, produced by the wind, and the pretty surroundings give a very pleasing picture."

In Zurich he received the most cordial reception by LUDWIG, "who has truly a noble and amiable nature. In the forenoon I was with him, most of the time in the Anatomical Institute, where I saw experiments, instruments, and collections; in the afternoon we strolled about in the neighborhood. He took pains to let me have a good time, but kept clear of strangers, so that we could discuss undisturbed what interested us most, and that we did to our hearts' content on all physiological and physical subjects." From Zurich Helmholtz ascended the Rigi, of which he gives a very enthusiastic description in a letter to his wife (copied by L. Königsberger, *l. c.* i., p. 153). From Fluelen he took the popular tour over the St. Gotthard, the Furka Pass, Rhone Glacier, Rosenlauig Glacier. He went over the Gemmi Pass to the peculiar watering-place Leuk (Loèche), to the Lago Maggiore, and by the way of Como to Milan, "the magnificent city with all the splendor of Italian life." The beautiful cathedral and the ruins of Leonardo da Vinci's masterpiece, the Cena, in the Palazzo Brera, incited his enthusiasm. At last he reached the "city of wonders, a living fairy-place," Venice. "All one sees in pictures, or reads in descriptions, is surpassed by the reality."

From Venice he travelled by way of Trieste to Vienna, where he was the welcome guest of BRÜCKE. Soon after his arrival Prof. WAGNER of Göttingen, and Prof. BUNSEN of Breslau, one of our most gifted chemists, appeared, "making us quite a learned company." Among the medical resources and glories of Vienna he made the acquaintance of ROKITANSKY, who showed him the excellent collection of anatomo-pathological specimens, and the wax-models of international fame. About one of their scientific discussions he wrote to Ludwig: "Rudolph Wagner also was present. He wanted to know our views on the connection

of the soul with the body, and other obscure points in physiology on which, at the time, there is nothing to be said at all." After a short stay in Breslau, to which Bunsen had persuaded him, he returned to Dahlem and thence, with his wife and child, to Königsberg.

His next publications were two reviewing papers, the one on his "**Graphic Presentation of the Velocity of the Nerve-Current in Frogs**" (Müller's *Archiv*), and a "**Report on the Modern Investigations of Animal Electricity,**" solicited by Karsten (*Kieler Allgemeine Monatsschr.*, 1852). In writing up the latter paper he found a theorem on "**the substitution of the irregular distribution of electro-motor forces within an irregular conductor by a distribution of electro-motive forces over its surface, in the same way in which the outward effects of a magnet may be replaced by the distribution of magnetic fluids over its surface.**" On the report of the investigations of Dubois which Helmholtz consented to elaborate for Karsten's journal, Dubois writes Helmholtz as follows: "It is evident that you will do it better than I could, and surely it will secure a larger circulation. I owe you my thanks." The quoted theorem makes Dubois somewhat uneasy, as, apparently, it weakens some of his results. He writes to Helmholtz: "I confess that your theorem is not clear to me; it appears to me either old, or inapplicable and wrong." Helmholtz replied that he had not found it in Kirchhoff and Smaassen's papers, but he gives him a new explanation, and said that Neumann had found it in his studies on induction currents, and had used it. As its publication could not be expected very soon, Neumann and he had agreed that Helmholtz should publish it. Whereupon Dubois replies: "At last I comprehend your theorem; this is a subject which should be presented to the Academy; but when you do it, please handle me gently."

Helmholtz's merits had determined the medical faculty of the Königsberg University to request the government to raise him to the position of professor in ordinary, which was granted, and effected by royal patent of December 17, 1851. His parents were overjoyed. According to the pattern of

the kymographion with which Ludwig had obtained the tracings of the fluctuations of the blood-pressure, Helmholtz constructed his myographion with which he obtained the tracings of the contractions of the muscles in curves, the vertical co-ordinates of which indicated the contractions of the muscle, the horizontal ones the proportional intervals of time. Two years later he made essential additions to these experiments. At this time, at the beginning of 1852, there appeared in the *Kiel Monthly for Science and Literature* the above-mentioned paper on "The Results of the Modern Researches on Animal Electricity." In a masterly manner he furnished an historical sketch of the development of the physiology of the nervous system, and discussed the interest connected with the solution of the question: "What is the occult agent which in tiny threads, acting to and fro, produces the most delicate gradations, the most powerful energies, and the most variable changes of sensation and motion, —this agent, the first link in the chain of processes, by which the soul that feels and wills, acted upon and re-acting, is connected with the outer world?" As early as 1743, the Leipzig mathematician HAUSEN declared that, in his opinion, this agent was identical with electricity. GALVANI thought that animal electricity was the source of all electricity, whereas VOLTA considered his contact electricity at the bottom of the manifold phenomena which electricity shows us. HELMHOLTZ, referring to the above question, says the nerve-current may be moved by waves, but, being much slower than the sound-waves, and still slower than the ether-waves, the waves could neither be aërial, nor ethereal, but very well the *action of molecules in the interior of nerves.*

After this series of connected investigations of the highest order, Helmholtz began to turn his attention and energy to physiological optics and acoustics, publishing, from time to time, papers in different journals, but in going over the whole field he produced two classical treatises: his **Physiological Optics,** of which the first part of the first edition appeared in 1858, the remainder several years later, and the treatise on **Physiological Acoustics,** which he published under

the title: *Die Lehre von den Tonempfindungen, als physiologische Grundlage für die Theorie der Musik* ("The Doctrine of Tone-Sensation, as the Physiological Foundation of the Theory of Music"), in 1862. He worked on both treatises at the same time, revising, in his thorough manner, every chapter of both, and enriching them by novel researches. Both present the actual status of the physiology of the higher senses in his time, and will stand for all time as monuments to his genius and working power, since fundamental work has everlasting value, be it in literature, art, or science.

December 22, 1851, Brücke wrote to Helmholtz: "It is well known that GOETHE in his *Farbenlehre* [Treatise on Colors] — of painful memory — declares all colors to be produced by the superposition of light and dark, as is evidenced by the fact that transparent media appear violet-gray, blue-gray, and blue, in front of a dark background, but yellow or red before a light background. . . . May I ask you to tell me whether in optics the different coloration of the reflected or refracted ray has ever been considered?" Helmholtz had recently made extensive researches on the perception of colors, which he had laid aside for the preparation of his lecture at the acceptance of his professorship at Königsberg, to be delivered June 28, 1852, and published under the title, **"On the Nature of the Perceptions of the Human Senses,"** in which he makes it clear that *perceptions are the mental interpretation of physical impressions received by our sense organs.* The impressions of air-waves by our cochlea are sound perceptions, those of ether-waves are sensations of light, color, form, motion, etc. The same ether-waves produce, besides light, also heat and chemical action, for there are ether-waves that are not revealed by the spectrum, as JOH. MÜLLER had previously made known in his remarkable paper on the specific energies of nerves. If a body acts on the optic nerve, nothing but the sensation of sight is produced; if the same body, for instance a glowing ball, is held near the skin behind the back, it will not be seen but felt by the skin as heat, etc. Helmholtz says: (*Biography*, i., p. 176): "Light and color sensations are only

symbols of actual conditions or objects; they have neither more nor less to do with the object itself than name or signature with a man. The differences in the appearance of objects as seen by different persons or through different media depend also on the condition of the media, including the eye, through which they have to travel. The media being never completely transparent, are responsible for differences in light, color, and other peculiarities which have received erroneous explanations from many observers (GÖTHE, BREWSTER, and a host of others). In regard to normal color-perception there is thus far no theory completely satisfactory. Helmholtz accepted Newton's theory of three fundamental colors: red, yellow, blue, with the modification of Thomas Young—substituting violet for blue.

In September, 1852, a son, Richard, was born to him and was baptized Richard Wilh. Ferd., on January 18, 1853, the coronation anniversary of the first Prussian king. His wife showed signs of pulmonary trouble, for which, in the first days of August, 1853, he took her with the children to her sister at Dahlem. He called on his friends in Berlin, where he also met Dr. Tyndall, the translator of his papers into English, and travelled (to see Donders) by way of Utrecht to London.

(To be continued.)

REPORT OF THE TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By C. DEVEREUX MARSHALL, F.R.C.S.

THURSDAY, JUNE 11, 1903. WILLIAM LANG, F.R.C.S., PRESIDENT, IN THE CHAIR.

Sub-conjunctival fistula formation in the treatment of chronic glaucoma,

Major HERBERT, I.M.S., described how this could be done either by producing a sub-conjunctival prolapse of the iris or by infolding the conjunctiva. The report deals with 130 cases in which iris was left prolapsed under a conjunctival flap, and in all but 18 eyes a small iridectomy was combined. A large number of these eyes were in an advanced stage of the disease and were therefore not very hopeful when an iridectomy only was done. For this reason a large incision was dangerous. The visual results of operations done from six months to upwards of three years previously were given. Only one eye has suffered from *late infection*, and this gave way rapidly to treatment. In two eyes there was *irido-cyclitis* immediately following the operation. In one case it caused *partial occlusion* of the pupil, and in the other, which was somewhat neglected, it led to *systematic ophthalmia*, with total loss of both eyes. The *sight* of another was *lost through protracted delay in filling of the anterior chamber*. These serious early complications were less numerous than when simple iridectomy was done. It is claimed that a filtering cicatrix can be obtained with certainty, and that in some cases this is the only way to relieve the tension. At any rate the risk is far less than if the tension is not relieved by the iridectomy. On the whole, the visual results were much better than could have been expected from typical iridectomy. Many cases

of so-called atrophy of the optic nerve after operation are in reality due to unrelieved tension.

A fistulous cicatrix is indicated (1) when iridectomy has already failed; (2) where it is likely to fail, such as in advanced cases; and (3) when the patient is not expected to return for a second operation if one is required. The danger to the other eye is a very remote one and would probably yield to mercurial treatment or enucleation. The connection of the iris with the prolapse can, if desired, be severed by a sub-conjunctival sclerotomy, cutting up through the attached base of the iris.

The second method of sub-conjunctival infolding into a small sclerotomy wound has proved effective in a number of cases. The aim was to establish a fistula unconnected with the uveal tract. By a special suture the flap can be kept in place long enough to keep separate the lips of the wound so as to form a permanent sub-conjunctival fistulous track. The ten cases which had this done are of too recent date to give a correct appreciation of its value. Other successful cases of conjunctival infolding without suture have been under observation for periods up to nearly two years. Many other attempts, however, failed to relieve tension through the flap not remaining infolded long enough, and in one eye the tension was far too much reduced. Apparently infective mild *iritis* came on and eventually *detachment of the retina.* Twenty-three operations were performed without suture or with imperfect suture.

Mr. PRIESTLY SMITH thought we were much indebted to Major Herbert for giving us his experience. The method of being certain of getting a fistula was by including iris or conjunctiva, but if it could be done without this it would be much better. Mr. TREACHER COLLINS said that from the result of pathological examinations a glaucoma was cured by opening of the angle or by the formation of a cystoid scar, and he had never seen one without iris or conjunctiva being in the wound. The risk of inflammation both to the eye and to its fellow was great. Sir ANDERSON CRITCHETT thought that lasting fame would attend any one who could devise a safe way of producing a cystoid scar. Major HERBERT briefly replied.

A case of melanosarcoma of the upper lid.

Mr. WORK DODD's paper was taken as read. The patient was a woman aged eighty-three, who had noticed a lump in the upper

lid for six weeks. There was no pain at first, but latterly there had been some. The tumor was situated in the centre of the upper lid and was about the size of a hazel-nut; there was no redness, œdema, nor tenderness. On the under surface the growth was soft, jelly-like, and vascular. The eyeball was almost hidden by the growth, but its movements were free. The patient had several wart-like growths about the body. The contents of the orbit were removed, the lower lid only being left. A Thiersch graft was afterwards applied.

Only forty-five cases of primary sarcoma of the eyelid have been recorded; ten were melanotic, and four of these originated in the palpebral conjunctiva. Van Duyse states: (1) of the few arising from the palpebral conjunctiva most were pedunculated, while those from the skin or mucous membrane are papillary in form; (2) these attained a considerable size before extending into the surrounding tissues.

In this case the tumor is pedunculated, and it has affected chiefly the free surface, leaving the skin, orbicularis muscle, and tarsal plate intact and healthy. All these circumstances point to its origin being the palpebral conjunctiva.

Mr. BISHOP HARMAN read an elaborate paper on the **innervation of the facial muscles.**

FRIDAY, JULY 3, 1903. W. LANG, F.R.C.S., PRESIDENT, IN THE CHAIR.

Keratitis, with special reference to the part played by the corneal cells. Dr. LESLIE BUCHANAN gave a lantern demonstration of sections of the cornea showing the changes following injury and disease. Proliferation of corneal corpuscles appeared to take a larger share in the production of new cells than exudation from the vessels of the limbus. Sections of the normal cornea showed a more liberal distribution of corneal corpuscles in the anterior layers than in those farther back. In inflamed areas budding of nuclei could be demonstrated, and this in advanced cases amounted to complete fragmentation of the original nucleus, the new nuclei being traceable along channels between the corneal fibres, presumably in the course of lymph currents. In other instances fibrillation of the corneal fibres and separation of the elements by œdema were manifest.

A case of **primary papilloma of the cornea.** Mr. C. W. DEAN reported this case. After pointing out the extreme rarity

of the condition, he stated that the patient was a fisherman, aged fifty-three, who was first seen in August, 1901. There was a tumor growing from the inner side of the left cornea. It had existed for about four years and had commenced as a minute speck on the "clear" part of the eye, and it had gradually grown principally towards the pupil. On August 30th the growth was the size of a flattened pea, and whitish in appearance. It was situated at the lower and inner quadrant of the cornea to which it was closely adherent. It slighly overlapped the conjunctiva. Some fine posterior synechiæ were present. Left vision was J. 14.

Mr. BICKERTON removed the tumor and the patient made a rapid recovery. In November the vision was $\frac{6}{6}$ and J. 2.

The examination of the tumor showed it to be a papilloma with much heaping up of horny epidermis. The site of the tumor is now hardly visible.

Three cases of **plexiform neuroma (elephantiasis neuromatosis) of temporal region, orbit, eyelid, and eyeball.** Mr. SIMON SNELL (Sheffield) related three cases. The *first* was a lady aged twenty-five, in which the deformity affected chiefly the right upper lid but involved also the lower eyelid and the tissues of the temporal region. The condition was congenital but had gradually increased. Considerable improvement in appearance was effected by removal of the much thickened tissue.

Case 2 was a youth aged nineteen. He had been first seen as a baby and again five years ago. The condition was congenital and the deformity was very great and occupied the left upper eyelid, the temporal region, and the side of face and orbit. The mucous membrane of the left alveolus and left side of the palate was also implicated. The eyeball was shrunken and small. The orbit was greatly enlarged and at its outer side there was felt a thickened mass in the situation of the lachrymal gland. Two operations were performed for removal of the thickened tissues from the orbit, eyelids, and the integument of the temporo-facial region with considerable improvement in appearance.

Case 3 was a boy aged seven. The condition affected the left eyelid, the temporal region, and the orbit; the eye was buphthalmic. It was congenital but had gradually increased, especially latterly. The globe was enucleated and on two occasions large portions of the thickened tissues were excised. In all three cases the tissues were dense and contained numerous coils of thick threads. Bleeding was very free.

The histological examination of the second and third cases was presented by Mr. TREACHER COLLINS. He had found that the skin in both cases showed thickening of the corium, but no inflammatory infiltration. In the subcutaneous tissue numerous sections of nerves were seen cut in various directions; there was marked thickening of the connective-tissue elements of both perineurium and endoneurium. Sections stained by Weigert's method showed the nerve fibres in the centre of these masses of thickened fibrous tissue.

Examination of the buphthalmic eye from the third case showed enlargement and thickening of the fibrous tissue of the nerves external to and lying in the sclerotic. The nerves of the cornea and uveal tract were enlarged and there was a congenital adhesion of the iris to the cornea, with a failure in development of the ligamentum pectinatum. This accounted for the increased tension and subsequent enlargement of the globe.

Mr. SNELL remarked that the literature of the cases was not very extensive. He referred to Alexis Thomson's monograph in which 58 cases of flexiform neuroma in different parts of the body were collected. Out of this number were 18 in which the eyelids, forehead, and temple were affected, but there was no reference to implication of the orbit.

The following card specimens were shown:

Dr. LESLIE BUCHANAN: (*a*) A specimen of an eye which was quite healthy previous to an injury ten weeks before, but which then suppurated and now on removal contained **bone in the shrivelled stump.** (*b*) A case of **keratomycosis.**

Messrs. W. C. ROCKLIFFE and L. H. PARSONS: **plexiform neuroma.**

THURSDAY, OCTOBER 29, 1903. JOHN TWEEDY, P.R.C.S., PRESIDENT, IN THE CHAIR.

The PRESIDENT delivered his opening address, in which he briefly sketched the **history of the Society.** He drew attention to several of the past presidents, and made a feeling allusion to the recent death of one of the oldest members of the Society, Mr. GEORGE LAWSON.

Tumor of the choroid in an eye suffering from old choroiditis.

Mr. NETTLESHIP.—The patient was a female, aged twenty-four, who had lost the use of the right eye. The eye was

quite blind and in a condition of absolute glaucoma. The eye was removed by Mr. Nettleship in 1894, and when last heard of, six years later, the patient was in good health. There was a doubtful history of tuberculosis in the family. The vision of the eye was defective when the patient was fifteen years of age, from detachment of the retina. There was a bulging in the ciliary region, and, as the eye was painful, it was removed. There was a large staphyloma near the ciliary region on the outer side, and corresponding to this internally there was an angiomatous sarcoma, the cells were round and oval, and it was somewhat pigmented. This was surrounded by a stratum consisting of fibrous tissue, in which there was much cholesterine. The optic nerve was atrophied, and there were one or two outlying nodules. Probably hemorrhage was the origin of this.

Mr. J. H. PARSONS thought the case was almost unique. Fuchs and Leber had collected cases associated with shrunken globes and definite cyclitic changes. He thought the condition suggestive of necrosis of the sarcoma.

Tumor of the choroid associated with iritis. By Mr. J. H. FISHER. The patient was a woman, aged fifty-two, whose left eye he had excised in October, 1902. Six years before, there was a cataract with detachment of the retina ascribed to a blow. The eye was removed on account of pain. A small vascular spindle-celled growth was found near the entrance of the optic nerve. It was pigmented and hemorrhagic and showed some signs of necrosis. A column of sarcoma cells could be traced along one of the posterior ciliary nerves. The speaker discussed the possible transmission of material from one eye to the other, as in those doubtful cases where sympathetic disease has been said to follow similar conditions.

An anomalous case of tobacco amblyopia.

Major F. O'KINEALEY described this case. The patient was an Irishman, aged forty-two, with a specific history. He had lived in India nearly all his life, and was a clerk. He had been a very heavy smoker, accounting for as many as five hundred Burmah cheroots per month, of the cheap and rank variety. The vision was only $\frac{4}{60}$ and J. 18. There was a central defect in both eyes and a limitation of the fields of vision for white. There were several irregular-shaped scotomata situated about the fields of vision. Tobacco and alcohol were cut off, and strychnine and iron were given with pilocarpine. Four months later the vision

was restored to $\frac{6}{6}$ and J. 1 with glasses, though the fields were even more contracted and the multiple scotomata had run together into a complete ring; color perception was still defective. The speaker also cited another patient, a Eurasian, who, from the same cause, reduced his vision to J. 18, with loss of fields for red and green and yellow; in two months he improved to $\frac{6}{6}$ and J. 1. The scotomata disappeared and color vision returned.

Mr. LANG referred to a statement made by Wingrave, that he had observed a corresponding defect in hearing in patients suffering from tobacco amblyopia, which had improved, with the vision, after giving up tobacco.

Mr. NETTLESHIP commented on the unusual occurrence of a further reduction of fields while the vision was improving.

Mr. HOLMES SPICER thought that a syphilitic retinitis might have had something to do with both cases, but Major O'KINEALEY said there was not the slightest evidence of this condition being present.

Mr. JOHNSON TAYLOR said he had never seen deafness associated with tobacco amblyopia.

The **pathological anatomy of the plaques in epithelial xerosis.**

Mr. MAYOU described this condition, and drew his observations from six typical cases. The plaques were situated on either side of the cornea and covered with bubbles of Meibomian secretion. The xerosis bacillus was found in five of the cases. Sections showed that they adhered only to the surface and did not penetrate. He gave his reasons for not considering these the cause of the disease. The changes in the epithelium were those due to exposure, and the superficial layer showed a well-marked layer of keratin on the surface. Beneath this was a layer of keratohyalin. There was a complete absence of cells showing mucoid degeneration.

Mr. Mayou thought that the mucin cells were one of the most important factors in bringing about hydration in the normal conjunctiva, and that, therefore, the essential change was keratinization of the epithelium, due partly to exposure and partly to deficient lachrymal secretion occurring in children of delicate health, and that the Meibomian secretion and organisms were simply adherent to the plaques, owing to the altered surface tension due to keratinization of the epithelium and the absence of mucoid changes therein.

Major HERBERT said that he had observed similar changes in other mucous membranes. He attributed these bad cases of xerosis to an absence of the mucoid cells in the lining epithelium.

The following card specimens were shown :

Mr. G. H. GOLDSMITH: A case of **retinitis proliferans.**

Mr. W. ADAMS FROST: **A demonstrating ophthalmoscope.**

Mr. R. W. DOYNE: A case of **varicose retinal veins, with thrombosis.**

Messrs. DOYNE and S. STEPHENSON: A case of **retinitis circinata.**

Mr. W. H. JESSOP: A case of **proptosis.**

REPORT ON THE TRANSACTIONS OF THE OPHTHALMIC SECTION OF THE BRITISH MEDICAL ASSOCIATION, ANNUAL MEETING AT SWANSEA, JULY, 1903.

By C. DEVEREUX MARSHALL, F.R.C.S.

WEDNESDAY, JULY 29, 1903. H. E. JULER, F.R.C.S., PRESIDENT, IN THE CHAIR.

Notes on operations for conical cornea.

The discussion on this subject was opened by Mr. STANFORD MORTON, who stated that he proposed to consider the treatment from an operative point only. Those operations chiefly used to produce flattening of the cone were: 1. Cauterization without perforation. 2. Cauterization with perforation. 3. Excision of the apex of the cone. There are scarcely sufficient data at present to decide in favor of any one method. In order to assist at arriving at some definite conclusion he brought forward in detail the results he had obtained after thirty operations on thirteen patients of which he had notes.

In a large majority of cases the operation done was excision of the apex. The cornea was transfixed with a long narrow Graefe knife and a small flap cut. It was then picked up with a small pair of forceps and an elliptical piece excised. This was designed to remove a piece 2 by 1*mm*. In two cases cauterization by burning concentric zones, as advocated by Sir Anderson Critchett, was done without perforation and another cautery was done with perforation. These operations are certainly not devoid of risk, and should only be undertaken when optical means fail. Among the dangers attending excision are: anterior synechia, iritis, and posterior synechia, increased tension, hypopyon. In cauterization with perforation these risks are the same, and though in cauteriza-

tion without perforation these are minimized, yet in one case increased tension followed requiring treatment.

It is difficult to specify the indications in favor of one or other operation. If the case were slight, the cautery would probably be indicated; the same also if complications such as posterior synechiæ were present.

Excision of the apex and cautery with perforation appear to involve about the same amount of risk. The scar, however, with the cautery is generally more extensive than the linear scar following excision. Flattening of the cornea being the object aimed at, is certainly best obtained with perforation. Whether, however, the advantages gained by the extra flattening are more than counterbalanced by the risks incurred, and whether the perforation should be effected by the knife or cautery, are points on which it will be easier to form an opinion when we have at our disposal more statistics giving full details of complete series of cases treated by the various methods. Mr. Morton read a letter he had received from Sir ANDERSON CRITCHETT, who said that his experience had led him to advocate his method by cauterizing concentric zones without perforation, because he believed it offered the best prospect of an average good result in the largest number. It was essential that the central spot made with the cautery should be as deep as possible short of perforation. He fully admitted the brilliant results sometimes obtained by good operators by the method of excision.

Mr. TATHAM THOMPSON described a method he had adopted of passing horse-hair sutures through the cornea, in order to produce flattening. This, however, he had given up, and now only cauterizes short of perforation. Latterly he had done an iridectomy previous to cauterizing, as he thought it lessened the chances of after-complications.

Mr. RICHARD WILLIAMS said that he had been so satisfied with the cautery without perforation that since 1886 he had used this method exclusively. His experience with excision had not been satisfactory. The former operation he thought far less free from risk. He thought, however, that a very large number of these cases did not require operation and could be improved sufficiently by glasses and general treatment.

Mr. DOYNE said he was in favor of cauterizing without perforating. He never found difficulty in obtaining sufficient flattening. The scar in course of time nearly disappears, and he never experienced any complication.

The President (JULER) said he had often excised the apex, but on the whole he preferred cauterizing and making a small perforation.

Mr. MORTON, in reply, urged the necessity of operators publishing series of cases. The publishing of single successful cases was useless, as by such means we should never be able to form a definite conclusion as to the best method of operating.

Extraction of cataract in its capsule. By Major SMITH, M.D., I.M.S.

Major SMITH said that the removal of the lens in its capsule was practised in the early days of extraction in Europe, but it fell into disuse as it was considered unsafe, although all recognized the value of it if it could be done.

Many surgeons in India practised it from Macnamara in the early seventies. Major Smith's experience extended over 8500 cases, and of these 2000 were done by the usual method, and 6500 were extracted in their capsules. Of 1023 cataracts extracted in their capsules, there was an escape of vitreous in 6.6 per cent. In 4 per cent. the capsule was left behind, and 99.4 per cent. gave first-class results. The *pupil reaction* is the most delicate test as to whether the eye is otherwise sound.

The *operation is performed* by making an incision at the corneo-scleral junction and at once taking out the speculum. The upper lid is then raised by an assistant with a hook, while with his thumb he depresses the lower lid; this controls the orbicularis, which in nearly all cases is the cause of vitreous being lost.

By pressure on the cornea with another strabismus hook, and by counter-pressure with a spoon at the wound, gradually the lens in its capsule is protruded. If the pressure be not made gradually, the capsule may burst and be left behind, though the experienced operator can even then generally remove it. It is of the greatest importance that plenty of time be allowed in extracting the lens, for if it be done quickly some complication is sure to occur.

The *visual results* of this operation are far ahead of any other method. *Iritis* followed where the capsule was left behind in about 5 per cent. of cases, and *4 out of the 1023 were failures:* one due to suppuration; one due to hemorrhage; and in another the eye shrunk after an extensive loss of vitreous. Iritis was, he thought, not due to bruising, but to the retention of lens matter and capsule.

By operating in this manner we practically eliminate iritis and "after-cataract," and the operation is in every way more desirable.

Mr. BISHOP HARMAN related a case in which he had accidentally removed the lens in its capsule; the eye did quite well.

Dr. BRAILEY thought it extremely difficult to know how great pressure the eye would stand.

The PRESIDENT had seen the operation done, but *rarely without the loss of vitreous.*

Major SMITH, in reply, said that experience was the essential thing and a beginner would be sure to find it difficult at first.

Subconjunctival injection of tuberculine from a diagnostic and therapeutic point of view. By Dr. DARIER (Paris). The patient was a girl, aged thirteen, who showed no sign of congenital or acquired syphilis, though she had a very tuberculous aspect.

One eye had been practically destroyed by repeated attacks of inflammation, and the other was beginning to become affected. She was suffering from a sclerosing form of keratitis. The other eye was buphthalmic and leucomatous. Hot applications, with atropine and mercurial lanoline, were used without much effect at first, but subsequently injections of cyanide of mercury were well borne and she improved somewhat.

Numerous other drugs were tried, but at last subconjunctival injections of tuberculine (TR.) were used. The local reaction was most violent. For eight days the eye was much swollen. When this subsided other injections were made, and in the end the vision of the right eye was $\frac{1}{15}$ and that of the left $\frac{1}{15}$.

Dr. DARIER also read a second paper on the treatment of **serious syphilitic diseases of the eye.** He thought that there was no method of applying mercury so efficiently as that of giving **intravenous injections of the cyanide.** This can with great advantage be injected subconjunctivally. Surgeons are so apt to be nervous at the first appearance of general symptoms of the drug, but it is absolutely essential to push it if these more serious complications are to be successfully treated.

Mr. SYDNEY STEPHENSON strongly advocated the methods recommended by Dr. Darier.

THURSDAY, JULY 30, 1903.

The discussion on the **eye changes in renal retinitis** was opened by Mr. NETTLESHIP. He said that although much is al-

ready known about the eye changes in renal disease, information is still needed both from ophthalmologists and physicians upon several points, and the following heads were suggested as furnishing suitable matter for discussion.

1. Does albuminuric retinitis ever occur in primary acute nephritis?

2. Cases of retinitis from lardaceous disease of the kidney and from nephritis due to inflammation of the bladder, ureter, or pelvis of the kidney should be recorded.

3. In the retinitis due to pregnancy it is important to know whether the kidneys were or were not sound before the first pregnancy. It seems that most cases occur between the ages of thirty and forty after several pregnancies, and several attacks of pregnancy dropsy, and that the prognosis of life is better than in ordinary renal retinitis. These facts support the theory that the kidney disease induced by pregnancy is a peculiar and often recoverable affection. All these cases should be examined for signs of chronic nephritis, as the propriety of inducing premature labor may partly depend upon the diagnosis in this respect.

4. If all cases of renal retinitis (except those due to pregnancy) are counted together without reference to age, there are found to be nearly twice as many males as females, the proportion being about the same as that of chronic nephritis. But when the retinitis occurs early in life the sex proportions seem, from the scanty material available, to be almost reversed.

5. Recognizing two chief factors in the production of renal retinitis,—the state of the blood, and the state of the retinal blood-vessels,—he asked for any cases in which a condition of visible disease of the retinal arteries was present without evidence of kidney disease, and whether such cases had been followed by unequivocal signs of chronic nephritis.

6. Do the characters of the retinitis in different cases justify any inference as to the kind of nephritis (chronic interstitial or chronic parenchymatous) from which the patient is suffering? The whole course of the cases should be carefully watched and two kinds of white opacities are to be distinguished: the soft-edged white or grayish-white patches in the nerve-fibre layer, and the brilliant, intensely white, sharply defined patches composed of confluent dots, situated in the deeper layers, and often arranged in the familiar radiating pattern around the yellow spot.

7. When retinitis occurs with glycosuria in which albumin

is also present, to which of these conditions is it due? Probably many of them are really cases of albuminuric retinitis, though sometimes diabetes only is present.

8. Of the other points requiring elucidation are the influence of (*a*) scarlet fever and (*b*) inherited syphilis in producing the chronic renal disease leading to retinitis. (*c*) The occurrence of renal retinitis in one eye only. (*d*) Cases in which more than one attack of retinitis has been seen and watched through, with special reference to the changes caused by the first attack, and to the effect of retinal atrophy upon the character of the second attack. (*e*) When pigment spots are left by renal retinitis, why are they so often found at the periphery of the fundus? (*f*) What is the cause of the night blindness occasionally met with in renal retinitis? (*g*) What causes the appearance of choroiditis in some cases? and, finally, what is the nature of the white opaque thickening of the coats of arteries and veins in some cases and of the appearance resembling retinitis pigmentosa in others?

Dr. GEORGE CARPENTER said that, with regard to juvenile retinitis, he had made routine examination of the fundus in cases of nephritis in children for many years. During that time he had come across three examples. Two of the cases occurred in chronic interstitial nephritis and both of them were verified post-mortem. There was a growing opinion that these cases in children were of syphilitic origin. The third case was one of parenchymatous nephritis in a girl of eight years. There was intense neuro-retinitis, and the changes were partly œdematous and partly degenerative. There was no evidence of syphilis. He thought that this condition was sometimes also due to syphilis. He thought that retinitis was not uncommon in interstitial nephritis in children, but what was uncommon was interstitial nephritis itself.

Mr. HENRY POWER recorded the case of a clergyman aged about thirty, whose health suddenly failed, and his vision became impaired, and on examination retinal hemorrhages were found, and radial spots at the macula. The urine was carefully examined and was found to be normal. Three weeks later the changes were more marked and the vision was worse. The urine was then found to contain much albumin, and the patient died a few months later. He had seen hemorrhagic retinitis in a pregnant woman who subsequently recovered.

Mr. HARTRIDGE thought that the cases should be divided into

those which were of toxic origin and those in which the changes are entirely due to changes in the blood-vessels. The cases that do well may be simply toxic. The character of the white patches are difficult to determine, but those that get well must be due either to exudation or else to loss of transparency. He related a case in a boy who had renal retinitis, and as he had syphilitic choroiditis the kidney disease was probably due to this.

Mr. SILCOCK asked Mr. Nettleship if he had seen retinal changes in surgical kidney; he himself had never done so except in cases associated with cardio-vascular lesions. Even in cases of prolonged suppression of urine in calculus-anuria he had failed to find retinal changes. He regarded the prognosis as very unfavorable, but he agreed with Mr. Power as to the retinitis of pregnancy.

Dr. REEVE (Toronto) mentioned two cases, one a man apparently in his prime who died of Bright's disease within six weeks of the first failure of sight; the other case was a man of middle age in perfect health but with myopic fundus changes. Later renal changes were developed and were associated with Bright's disease.

Mr. NETTLESHIP in reply said that the greatest care should be exercised when giving a prognosis.

Epithelial plaques of the conjunctiva.

Messrs. LISTER and HANCOCK brought forward four cases of rare epithelial tumors of the conjunctiva.

Cases 1 and 2 were in young people under twenty-five. The small growths were of a yellowish color, and were *situated near the limbus above the cornea.* One had been removed, but had recurred at the same situation. The surface was dull and one was marked with furrows, which corresponded microscopically with minute papillæ. They differed from dermoids in containing neither glands nor hairs, and from xerosis patches by the absence of the frothy appearance; the patients were otherwise healthy, and there was no night blindness.

Cases 3 and 4 were in people well over middle life; the growths were of a dead white color, like sodden epithelium. One of them had some small pink spots which corresponded to minute, thin-walled blood-vessels; the other had no blood-vessels.

Clinically they somewhat resembled epithelioma of the conjunctiva, but differed from it in that they had not the convoluted edge, and in color they were too white.

Microscopically all the growths consisted of greatly thickened conjunctival epithelium. None of the cells passed into the connective tissue.

The growths correspond more nearly with callosities of the skin, rather than with warts or corns, and until further information were collected the authors were inclined to give them the more general title of "epithelial plaques of the conjunctiva."

Dr. KARL GROSSMANN described a case of **aniridia**, in which he observed the effect of eserine on the shape of the lens. He found that both the anterior and posterior surfaces of the lens became bulged, and the equatorial diameter of the lens became less.

Mr. HARMAN thought it unwise to draw general conclusions from a single case that was evidently abnormal.

The corneal lesions in acquired syphilis.

Mr. SYDNEY STEPHENSON said that there were two ways in which acquired syphilis may affect the cornea: (1) as an interstitial, diffuse, or parenchymatous keratitis; and (2) as a true keratitis punctata, described by Mauthner. The latter must be carefully distinguished from ordinary keratitis punctata. Mauthner's is a primary specific affection of the cornea, and the spots are lying at various depths in its substance. There may or may not be episcleral injection; the condition rapidly develops and equally rapidly disappears. The iris is not involved, and Mauthner looks upon it as a gummatous infiltration of the cornea. He describes the case of a man, aged twenty-nine, who developed the condition four years after he had contracted syphilis. It disappeared six weeks after he had been under mercurial treatment.

Hutchinson at first stated that interstitial keratitis was never seen in acquired syphilis, but since then numerous cases have been described. Statistics showed that from 1.9 to 10 % of all cases of interstitial keratitis are due to acquired syphilis.

The chief characteristics of the disease are that it is usually unilateral, non-ulcerative, and patchy, and that it usually quickly responds to treatment.

Mr. Stephenson described two cases he had seen in adults, and it should be remembered that extragenital syphilis is by no means unknown in children. He described a case in which a child, aged twelve, had the typical patchy keratitis, and it was found that when a few months old she had had what was evidently a chancre

of the lid, which was followed by the skin eruption, etc., of secondary syphilis.

In cases he had collected, the average time in which it had showed itself after primary infection was 10.8 years, the extremes being 23 years and 3 weeks. In the latter case it occurred with the primary lesion, but usually it is associated with tertiary manifestations.

Mr. DEVEREUX MARSHALL mentioned a case that had come under his own observation in which the choroid was first affected, and subsequently keratitis developed.

The use of retinal extract in atrophic retinæ. By R. W. DOYNE.

When first led to try this, it was with the idea of supplying, in excess to the blood, a specific food that was especially valuable to the retina. The results have been so marked that it points rather to the presence of some physiological principle, such as is analogous to the thyroid gland. Fresh retinæ are the most valuable, but a somewhat complicated preparation is made by Burroughs & Welcome, called "Optocine," and this is successful. One drawback to the treatment is the expense, as from six to ten fresh retinæ a day are necessary. The supply is limited, and they must be quite fresh.

In the great majority of cases treated, the great improvement noted is so definite that we must conclude it is due to the remedy. It doubtless acts by bringing out a potentiality that may remain in an atrophic retina. In five cases of retinitis pigmentosa in which it had been tried, they all showed improvement, but the treatment must be persevered with, or they relapse. In four cases of tobacco amblyopia, they all showed the most marked improvement. In a case of optic atrophy, where the patient had been unable to do more than count fingers for many months, she improved in eight weeks to such an extent that she could read words of J. 4, and she is able to walk about alone and do shopping.

Another case of atrophy, due to tabes, also showed marked improvement. Similar improvement was seen in a case of old choroiditis, with a damaged and thin retina, the result of myopia.

When he first paid attention to this subject he had no idea that any one else had done the same, but he had since discovered that Louis Dor, in 1897, and Lagrange, in 1898, had used an extract of vitreous and ciliary body.

Mr. SYDNEY STEPHENSON mentioned three other cases in which this treatment had been adopted with excellent results, and one was a case of tobacco amblyopia, which improved directly, in spite of the continued use of tobacco.

Mr. NETTLESHIP had seen some of Mr. Doyne's cases, but he was not quite convinced of the very marked improvement that was said to have taken place.

Dr. EDRIDGE-GREEN said that some years ago he had tried to prepare an extract of visual purple, but this had quite failed.

Dr. DARIER had previously tried extract of retina, choroid, and ciliary body. He injected this subconjunctivally; the patients improved under it, but he got nearly as good results with injections of sodium chloride.

FRIDAY, JULY 31, 1903.

Discussion on the treatment of concomitant convergent strabismus.

Mr. G. HARTRIDGE opened this discussion and commenced by emphasizing the importance of studying the various factors which helped to produce the condition and the need of a careful examination in each case. The effect is binocular, and is the result of excessive innervation of the internal recti muscles by the associated act of accommodation. The causes of it are: (1) hypermetropia ; (2) imperfect development of the fusion faculty; (3) defective visual acuteness of one eye; (4) anatomical conditions of the eye.

One or several of these conditions may be present in any one case, and a careful examination is essential.

The objects of treatment must be the correction of the deformity and the establishment of binocular vision.

The treatment may be divided into (1) optical, (2) orthoptic or educational, (3) operative.

He described the various educational methods that have been employed, and showed some of the instruments used. Optical and orthoptic treatment must be honestly carried out for at least a year before an operation is thought of.

With regard to operations, these are all unscientific, as we can only touch the muscles, whereas the defect is in the innervation, and the defect often tends to diminish towards the age of puberty without apparent reason. Hence eyes that have been operated on early may diverge. Even if the eyes are put straight, the

operation itself tends frequently to produce deformities that are often by patients and surgeons alike ignored.

Tenotomy produces a shrunken caruncle, and advancement a considerable thickening over the advanced muscle.

He then discussed the advantages of the different operations that may be performed, and invited discussion on three points:

1. Should the two eyes ever be operated on at the same time?
2. When should the operation be undertaken?
3. What operation gives the best result?

The following paper, bearing on the same subject, was then read:

Convergent Squint.

Methods of preserving or restoring the sight of the deviating eye and of establishing binocular vision. By CLAUD WORTH.

Mr. WORTH said that having been engaged for several years in investigating the subject of squint, he had made detailed notes of more than 1800 cases of convergent squint, an account of which had been published in his book, *Squint.*

In it he proved that congenital amblyopia is very rare, and that at the first appearance of a squint the corrected vision of the deviating eye is almost always as good as its fellow. Yet after a time the deviating eye becomes almost blind, as the result of long-continued suppression of the vision of the eye, and this might all have been prevented.

Whether the sight can be restored depends much upon the length of time this suppression has lasted, and, therefore, the first thing to do is to preserve the sight of the squinting eye by forcing the child to use it, and to at once correct the refraction. No child is too young for this, and many of his patients had worn glasses before they were three months old, and had been cured before they were able to walk.

It was important that the frames should be made with very short sides, reaching only to just above the ears, and these should end in loops, so that they can be tied on. The bridge should have a broad flat piece of tortoise shell fitted so as to distribute the pressure on the nose. After the first hour or two the child will wear them as readily as clothes. In order to exercise the deviating eye for near things, atropine should be used to the fixing eye only, every morning. This eye, therefore, cannot be

used for near objects, so the child then gets into the habit of looking at his toys with the deviating eye. If the child is young enough the sight gradually improves, and he may then even squint with the atropinized eye. The drops are then left off, and thus the eye is saved from becoming amblyopic.

If central fixation has already been lost, an attempt may be made to restore it by continuous occlusion of the fixing eye by a pad; if this succeeds, treatment with the amblyoscope should be practised. The most harmful practice is to use atropine for the two eyes, for this effectually prevents the deviating eye from making any attempt at exercising itself.

He had found certain evidence of a desire of binocular vision between five and six months, though probably a certain degree existed before this. Towards the end of the first year a considerable effort will be made in the interest of binocular vision, and binocular vision reaches its full development by the sixth year. After this age, fusion training is merely waste of time.

He then described the "amblyoscope" and its method of use. In many cases the desire for fusion brings about a sudden cure of the squint, and no matter what deviation is present, if one can establish a desire for binocular vision, a permanent cure may with confidence be expected.

Mr. TATHAM THOMPSON agreed that the early correction of optical errors was the correct thing to do, yet he had never enforced correcting glasses before two years of age. He relied much on the use of atropine to the fixing eye. He never operated on both eyes at the same time, and he thought that tenotomy was justifiable in a certain number of cases. In high degrees, advancement with tenotomy of the opposite muscle was necessary.

Mr. MADDOX expressed our indebtedness to Mr. Worth for insisting upon early training. He made some suggestions for simplifying the use of the amblyoscope.

Mr. HARMAN spoke of the comparatively late development of binocular vision in man.

Dr. REEVE (Toronto) said he should never operate on both eyes at the same time, and thought that there was a tendency to try and get too much effect from division or advancement of one muscle. He described several operations.

Mr. GRAINGER was strongly in favor, when advancing a muscle, of shortening it without cutting away any part of it. He described the method he usually adopted.

Mr. LISTER thought that operations that could be done under cocaine were most satisfactory, though by no means so if a general anæsthetic were used.

Mr. HARTRIDGE, in reply, said that anæsthetics were necessary in children.

Mr. WORTH said that in cases in which he had been able to train the fusion sense, he had no hesitation in resorting to operation at any age, because the trained fusion sense could be relied upon to do the fine adjustment; but in cases in which binocular vision was out of the question he never operated until he was able to do so under cocaine.

Mr. TATHAM THOMPSON read a paper on the **fixation of the eyeball during operations in intractable patients.** This consisted in passing sutures on both sides of the cornea in the conjunctiva. By making traction on these sutures, the eye could be rotated downwards, and this caused far less gaping of the wound than when a pair of fixation forceps were used.

Mr. BEAUMONT described some double forceps he had used with the same object.

Mr. H. C. ENSOR described an operation he had devised and performed for the **relief of ptosis.** It consisted in removing a strip of skin below the eyebrow and then cauterizing the subjacent tissues. This caused a scar which, by contracting, raised the lid in a much more efficient manner than is usually obtained by those operations which depend for their action on attaching the lid to the occipito-frontalis muscle.

Preliminary note on the pathology and diagnosis of spring catarrh. By Major HERBERT, I.M.S.

In this report he dealt only with spring catarrh as met with in India among the natives. He chiefly wished to draw attention to the remarkable infiltration of the affected tissues, both ocular and palpebral, with eosinophile leucocytes. By appropriate fixing and staining, these special cells can be seen to form a large proportion of the cells which infiltrate the tissues. This infiltration is rare in other parts of the body, occurring only in some cases of pemphigus of the skin.

The presence of eosinophiles in the exudation may be useful as a ready means of diagnosis. There is ordinarily very little exudation in these cases, but it is quickly induced by slight irritation, such as by everting the upper lid for examination. If this be

done, a thin layer of exudation can be obtained, and if this be examined, eosinophiles are found in great numbers.

In ordinary conjunctival exudation there are hardly any of them present. This fact should be taken into consideration when dealing with the pathology of this somewhat curious affection.

Finally, in some of the sections shown stained with polychrome methylene blue, there are intracellular bodies which may possibly be parasites. Some of them at least are very different from the hyaline bodies that may be seen in trachoma and other chronic inflammations.

Further note on the superficial punctate keratitis of Bombay. By Major HERBERT, I.M.S.

This affection, that he had previously described, is most prevalent in the warm weather, at the close of the rainy seasons. In October, 1901, there was a severe epidemic, and these cases formed one-fourth of the total out-patients attending the hospital. At first there are thickening and injection of the conjunctiva and a trace of ciliary injection. Then the dots on the cornea, which stain with fluorescine, appear. An encapsuled bacillus is found, but the author had not been able to find out much about it and the part it took in the disease.

Modified Mules's glass ball for use after removal of the eye. By ADOLPH BRONNER.

Dr. BRONNER said that the operation he was in the habit of doing was that of inserting a glass globe into the capsule of Tenon. This, however, not uncommonly came out. He had now devised a glass ball with a hole through the middle. By a somewhat elaborate method of stitches this is held in, and it is less liable to come out than formerly with the simple globe.

The knee-jerk phenomenon in patients suffering from interstitial keratitis. By N. BISHOP HARMAN.

It having been stated that in cases of interstitial keratitis the knee-jerks are absent, Mr. HARMAN examined a large number of children suffering from the disease, as well as a large number of healthy individuals who showed no sign of congenital syphilis. The result was that there was practically no difference in the reflex in the two classes of case.

Messrs. DOYNE and BEAUMONT had also investigated the subject, and they both agreed with Mr. Harman.

An improved operation for congenital ptosis. By N. BISHOP HARMAN.

The operation described by Mr. HARMAN was a modification of Mules's operation, and instead of using wire he used a very fine gold chain. This had many advantages over the wire, chiefly because the tissues would take a greater hold upon it, and it would be possible to evert the lid if necessary without running the risk of breaking the wire through bending it. He also described his method of inserting it.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FOURTH QUARTER OF THE YEAR 1902.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin:

WITH THE ASSISTANCE OF

Prof. A. Alling, New Haven; Prof. E. Berger, Paris; Dr. Dalén, Stockholm; Prof. Hirschmann, Charcow; Dr. J. Jitta, Amsterdam; Dr. Krahnstöver, Rome; Mr. C. Devereux Marshall, London; Dr. P. von Mittelstädt, Metz; Prof. Da Gama Pinto, Lisbon; Dr. Heinrich Schulz; and others.

Translated by Dr. Ward A. Holden.

(*Concluded from page 616 of Vol. XXXII.*)

Sections XIII.–XVIII. Reviewed by Dr. O. BRECHT, Berlin.

XIII.—LENS.

537. **Kozlowski.** The simple extraction of cataract (based on 422 cases in the Popoff Hospital in the years 1896–1900). *Arch. f. Augenheilk.*, xlvi., p. 162.

538. **Archangelskaja.** Eleven hundred cataract extractions. *Wratsch*, 1902, No. 42.

539. **Lindenthal.** A case of spontaneous intracapsular absorption of a senile cataract. *Hygeia*, 1902, No. 11.

540. **Kirn.** A case of injury of the lens with an unusually good outcome. *Deutsche militar. Zeitschr.*, xxxi., 10, p. 519.

541. **Schliep.** On zonular cataract. *Inaug. Dissert.*, Tübingen, 1902.

542. **Pflueger.** The operation for secondary cataract. *Bull. et mém. d. l. soc. franç. d'ophtal.*, xix., p. 405.

543. **Eha.** A clinical contribution to the subject of congenital ectopia lentis. *Inaug. Dissert.*, Tübingen, 1902.

544. **Eliot, R. H.** An analysis of a series of five hundred consecutive operations for primary cataract performed in five months in the government ophthalmic hospital, Madras. *The Lancet*, Nov. 8, 1902.

545. **McKeown.** Double case of congenitally displaced transparent lens treated by discission. *Brit. Med. Jour.*, 1902, xi., 1.

546. **Story.** Zonular cataract. *Ophth. Review*, Sept., 1902.

547. **Hough.** Summary of cataract operations performed at the N. Y. Eye and Ear Infirmary for the year ending Sept. 30, 1901. *N. Y. Eye and Ear Infirmary Reports*, 1902.

KOZLOWSKI (537) gives a detailed description of his preliminary and after treatment in cataract cases. He prefers extraction without iridectomy, yet in 5 % of his cases he is forced to make an iridectomy during the operation. He had prolapse in 8 % of cases. Discission is done ten or twelve days after the operations, with a Graefe knife. It was required in 17.5 %. In 422 cases he had iritis in 6, iridocyclitis in 2, and glaucoma in 2. Vision determined 10–12 days after operation was in 75 % of cases 0.1–0.2.

Eleven hundred cataract operations were done by ARCHANGELSKAJA (538) in rural practice in Moscow between 1887 and 1901. Ninety-two % were senile cataracts; 8 in young persons. In 80 %, Graefe's linear extraction with a broad iridectomy was done; in the others, the operation without iridectomy. Complications were glaucoma in 2 %, iritis in 10 %, infection and loss of the eye in 2.8 %. In 6 cases death resulted: in 2 cases from dysentery, in 1 from croupous pneumonia, in 1 from paralysis of the heart, in 1 from œdema of the lungs, and in 1 from apoplexy. V = 0 in 3.6 %.

HIRSCHMANN.

LINDENTHAL'S (539) patient noticed at the age of forty-six that vision was becoming affected in the left eye.

A senile cataract was found. After the eye had been blind for ten years, the vision gradually improved and reading became possible. The cataract now appeared as a membranous formation with some portions almost transparent. With + 9, V = 0.2; with + 14, Jaeger V. The cataract was removed *in toto* and examined microscopically. Peripherally there was a residuum of nucleus; in the transparent portions the layers of capsule lay in apposition, and here the subcapsular epithelium was wanting.

DALÉN.

KIRN (540) observed a case of injury of the lens which did not lead to total opacity. The patient was a man of thirty-six who

sustained a perforating injury, 3–4*mm* long, at the limbus, inward and below, from a splinter of glass. Prolapse of the iris. Hyphæma. V = 0. Gradually a partial swelling of the lens came on, with absorption later. After fifteen months, the pupil was round and responsive, the lens was present, and exhibited a slight haziness and a denser opacity as large as a pinhead at the point of injury. With − 7, V = $\frac{6}{9}$.

SCHLIEP (541) made a statistical report on 178 cases of lamellar cataract seen in the Tübingen clinic; 60 % of the patients were males and 40 % females. Two cases were unilateral. In 59 % there were undoubted signs of rickets present. Statements in regard to previous convulsions were so frequent and so vague that they seemed of no value in an etiological way.

PFLUEGER (542) calls attention anew to the importance of avoiding loss of vitreous in operations for secondary cataract. He enters his needles at the sclero-corneal margin, preventing the escape of aqueous and the prolapse of vitreous into the wound. Only secondary cataracts of the arido-siliquata variety should be extracted, the extraction of all varieties being dangerous.

BERGER.

EHA (543) reports 22 cases of ectopia lentis seen in the Tübingen clinic; 12 were in males, 10 in females. In 6 there was also ectopia of the pupils, but not in the same direction as the ectopia of the lens. In 2 there was congenital aniridia, and one had a coloboma of the iris. In 7 cases the lens was displaced upward, in 11 downward. Heredity seemed to have some influence in 32 % of cases. Hereditary astigmatism was found in but two cases.

ELIOT (544) reports 162 operations: Simple extractions 98, with iridectomy 44, preliminary iridectomy 7, linear 2, intraocular hemorrhage occurred once, panophthalmitis three times. Prolapse of iris eight times. ALLING.

XIV.—IRIS.

548. **Handmann.** The treatment of tuberculosis of the iris with tuberculin. *Klin. Monatsbl. f. Augenheilk.*, xl., 2, p. 219.

549. **Anargyros.** Melanoma of the iris. *Arch. f. Augenheilk.*, xlvi., p. 62.

HANDMANN (548) treated two cases of tuberculosis of the iris with tuberculin (TR.) with good results.

The patient was a boy of eleven, with unilateral interstitial keratitis, nodules in the iris, pleuritis, isolated glands, and probably general tuberculosis, although this could not definitely be made out. The condition of the eye grew so bad that tuberculin was used. Injections beginning with 0.001 and increased to 3, were given over a period of a year and a half. Recovery, with vision almost $\frac{6}{6}$.

The second case was in a woman of twenty-one, both of whose eyes were affected, yet she recovered. Thirty-one injections were given, ranging from 0.001 to 2. No other particular treatment. In this patient the temperature rose in the evening once as high as 39° C., and there was albuminuria. The author recommends this treatment.

ANARGYROS (549) had the opportunity of examining the eye of a man of sixty-two with melanoma of the iris—the ball being enucleated on account of infection after extraction. In life one saw a brownish-black tumor extending obliquely behind the iris from the inferior pupillary margin, and two small nodules at the upper-outer margin of the pupil. Examined anatomically, there was a round nodule rather less than 0.5*mm* in diameter, nearer the ciliary than the pupillary margin, which had not been visible in life. The tumor was composed of irregular cells so thickly crowded with pigment that the nucleus could not be seen. The cells in places were confluent and formed great black masses. Some lay isolated in the stroma of the iris. Melanomata arise from the retinal pigment layer, both the anterior and posterior strata, and usually from both. Similar cases have been reported by Fuchs and by Knapp.

XV.—CHOROID.

550. **Reis.** On a peculiar change in the choroid after ophthalmia nodosa. *Arch. f. Augenheilk.*, xlvi., p. 250.

551. **Meier.** The etiology of disseminate choroiditis. *Inaug. Dissert.*, Tübingen, 1902.

552. **Bruns.** A contribution to the knowledge of choroidal sarcoma. *Graefe's Archiv*, liv., 3, p. 563.

553. **Van der Hoeve.** Remarks on macular coloboma, with report of a new case. *Arch. f. Augenheilk.*, xlvi., p. 66.

554. **Wiener.** Metastatic sarcoma of the choroid. *Journ. Amer. Med. Assoc.*, Nov. 8, 1902.

REIS (550) had the opportunity of examining a case of oph-

thalmia nodosa twelve and a half years after injury with a caterpillar. The earlier history was published in these ARCHIVES, xxv., p. 359. A fresh injury of the unaffected left cornea caused the patient to seek treatment. The right eye showed, as before, several small subconjunctival nodules, and a tongue-shaped, dense cicatricial opacity in the lower portion of the cornea in which a hair was imbedded. There was found also circumscribed atrophy of the anterior layer of the iris, with obliterated new-formed vessels, broad posterior synechiæ, a white exudation upon the anterior capsule, and a Y-shaped pigmented figure in the choroid with partial atrophy. V = $\frac{20}{50}$. In 1892 it was $\frac{20}{200}$.

The long persistence of the conjunctival nodules led the writer to excise one for examination, and he found in a connective tissue rich in nuclei a surprisingly well-preserved hair. This confirmed the view that the nodule remains while the hair is in the tissues. The writer believed the choroidal changes to be due to a wandering caterpillar hair.

MEIER (551) examined 238 cases of choroiditis disseminata seen in Tübingen in respect to their etiology: 56 % were in males, 44 % in females; 50 % began between the ages of ten and thirty. In the females chlorosis was usually present. Acute infectious diseases, such as erysipelas of the face, scarlatina, and rheumatism of the joints, seemed to be etiological factors; syphilis and tuberculosis rarely.

The interesting feature in BRUNS'S (552) case was the ingrowth of sarcomatous masses between the inner and outer nuclear layers, and the presence of numerous circumscribed groups of non-pigmented cells lying between the lamina vitrea and the pigment epithelium. The condition was similar to that found in Knapp's case (these ARCHIVES, iv., p. 83). The origin of the foci, in the writer's opinion, depended upon the dissemination of cast-off particles of the tumor.

Cases of metastatic sarcoma are rare in the eye. WIENER (554) reports one, in which the autopsy showed multiple sarcomata scattered over the body, with new growths in both eyes. The starting point probably was in the mediastinum. ALLING.

XVI.—VITREOUS.

555. **Klapper.** On the recurrent retinal and vitreous hemorrhages in young people. *Inaug. Dissert.*, Leipsic, 1902.

XVII.—GLAUCOMA.

556. **Wygodsky.** On the results of iridectomy in primary glaucoma. St. Petersburg, 1902, p. 213.

557. **Cutler, C. W.,** and **Gibson, C. L.** Removal of the sympathetic cervical ganglion for the relief of glaucoma. *Annals of Surgery*, Sept., 1902.

558. **La Motte.** The new surgical treatment of glaucoma. *Ophth. Record*, Oct., 1902.

Wygodsky (556) uses in his treatise the material of the private hospital of the late Professor Donberg, his own material, and that of the eye department of the local institute. The total number of patients was 61,085. Among 1247 patients with primary glaucoma there were 1777 glaucomatous eyes. Iridectomy was done in 458 eyes. The essential conclusions of this scientific and extensive treatise are as follows: Iridectomy is indicated in all periods of inflammatory glaucoma, for even in the latest period there is a chance of improvement. The prognosis is the better the earlier the operation is undertaken. The best prognosis is when the operation is done in the prodromal stage; the next best, in acute inflammatory glaucoma. In chronic inflammatory glaucoma, the prognosis is less favorable, but always the more favorable the earlier the operation is undertaken. The prognosis is fairly good in the typical glaucoma simplex. Since miotics are of little value in this form, and iridectomy delays if it does not check the progress, it is indicated, but only in cases with greatly increased tension, good central vision, and a fairly unrestricted field. The prognosis is better in simple glaucoma when there are intermittent inflammatory attacks.

On recurrence of the glaucoma, a sclerotomy or a second iridectomy is to be done at once. Sclerotomy alone is unsatisfactory, and its effect transitory. Miotics cannot take the place of operation. Hirschmann.

Cutler and Gibson (557) report a case of sympathectomy in a man of fifty-six who suffered from chronic inflammatory glaucoma. In spite of sclerotomies and iridectomy, the vision of the right eye was reduced to fingers at three feet, and in the left was absolute glaucoma. Pain was constant, the discs were cupped, and the nerves atrophic. Eserine improved the right eye to $\frac{20}{200}$ +. Right cervical sympathetic was excised. Later pupil became smaller, field of vision somewhat larger, and the right optic nerve seemed less pale. There was slight ptosis. Vision = $\frac{20}{30}$ +. After a year the vision was the same, but the field had narrowed. Alling.

La Motte (558) presents two cases of sympathectomy—the first a soldier of twenty-seven upon whose right eye an iridectomy had been done after three attacks of acute glaucoma. In spite of this the vision was reduced to perception of light in both eyes and there was considerable pain. Sympathectomy was done on the left side, with the immediate relief of pain; and the vision improved to nearly normal. The second patient was a woman of thirty who apparently had suffered from acute glaucoma. A double sympathectomy was performed, and there has been no return of the disease; the time, however, has been short. In both cases there remained slight ptosis, and in the last an area of anæsthesia on the side of the face and neck involving part of the ear.

Alling.

XVIII.—SYMPATHETIC OPHTHALMIA.

559. **Warazidlo.** A case of sympathetic inflammation after optico-ciliary neurectomy. *Inaug. Dissert.*, Greifswald, 1902.

560. **Welt.** Pathological and bacteriological researches on sympathetic ophthalmia. *Revue méd. de la Suisse romande*, May, 1902.

Warazidlo (559) describes a case from the Greifswald clinic in which after neurectomy a sympathetic inflammation appeared. The neurectomy was not complete since the sensibility of the cornea was not completely lost. A neurectomy was proposed but abandoned because of severe hemorrhage.

Welt (560) reports on the pathologico-anatomical changes in the sympathizing eye of a patient whose other eye had an irido-cyclitis four years before, after an injury. No micro-organisms were found. In general the evidences of an irido-choroiditis were observed. The writer gives a *résumé* of the six cases published of examination of the sympathizing eye, all of which exhibited inflammation of the uveal tract, chiefly about the vessels, which were surrounded by a sheath of mononuclear round cells, and ending in the formation of membranes. The changes in the optic nerve are less intense than those in the uveal tract.

Berger.

Sections XIX.–XXII. Reviewed by Dr. v. HASELBERG, Berlin.

XIX.—RETINA AND FUNCTIONAL AFFECTIONS.

561. **Koppen.** A contribution to the pathological anatomy of the retina in chronic nephritis, with special reference to the stellate figure in the macula. *Zeitsch. f. Augenheilk.*, Dec., 1902.

562. **Pflueger.** A case of retinal arteritis and phlebitis. Injections of oily solution of biniodide of mercury. Partial gangrene of the buttock. *Bull. et mém. d. l. soc. franç. d'opht.*, xix., p. 344.

563. **Gouin.** Anatomical examination of an eye with developing retinitis pigmentosa causing an annular scotoma. *Ann. d'ocul.*, cxxviii., p. 401.

564. **Golowin.** Changes in the eye in anencephaly. *Wjest. ophth.*, 1902, No. 6.

565. **Capauner.** Treatment of scintillating scotoma. *Ann. d'ocul.*, cxxviii., p. 277.

566. **Bull, G. J.** On the asthenopia produced by pinching the lids together. *Bull. et mém. d. l. soc. franç. d'opht.*, xix., p. 577.

567. **Maher, W. O.** Glioma of the retina. *Australasian Med. Gazette*, Aug. 20, 1902.

568. **Newton, R. Earle.** Glioma of the retina. A remarkable family history. *Ibid.*

Koppen (561) examined microscopically two eyes obtained in the Marburg clinic, with special reference to the genesis of the stellate figure at the macula. He does not accept Nuël's view that there is a primary degeneration of Müller's fibres, but he finds that there are hemorrhagic foci among Müller's fibres due to changes in the vessels. The outer reticular layer is particularly disposed to this affection, since in it run the finest capillaries, in which changes first make themselves manifest. The stellate figure is due to the fact that small capillaries run in toward the macula from all sides without quite reaching the fovea centralis.

Pflueger (562) reports a case of endarteritis and phlebitis of the retina treated by intramuscular injections of biniodide of mercury dissolved in oil. After an injection there was severe pain, and later gangrene of the buttock. Pflueger believed that the ischiadic artery or one of its branches had been injured. Similar cases have been reported by Brocq and by Leeser. Pflueger recommends the giving up of intramuscular injections and the return to subcutaneous injections of mercurial salts that are soluble. Berger.

In Gouin's (563) case of retinitis pigmentosa with a ring scotoma, the zone of pathological changes in the retina corresponded to the defects in the field. The changes begin in the layer of rods and cones and then extend to the outer retinal neurons.

Berger.

Golowin (564) had the opportunity of examining the eyes in four cases of anencephaly. The principal defects were in all four cases atrophy of the nerve cells of the retina and absence of the nerve fibres in the retina and optic nerve, while the rods and

cones were normal. In all the cases there were remains of the pupillary membrane, and embryonic tissue and vessels about the lens and in the vitreous. A characteristic accompanying symptom was the accumulation of liquid in the retina and nerve. The writer considers all these changes secondary, due to hydrocephalus. HIRSCHMANN.

CAPAUNER (565) had used massage during the attack in 12 cases of typical scintillating scotoma, with the result of quickly checking the attack. He reports, further, cases in which massage was employed between the attacks, with the result that the attacks ceased. The writer fails to allude to the fact that Manz, in 1893, stated that compression of the balls would check some cases of scintillating scotoma. BERGER.

BULL (566) has in a previous paper (*Transactions Eighth International Congress of Ophthalmology*, 1894, p. 107) shown that the pressure of the upper lid upon the cornea may produce horizontal ridges and that in consequence of such pressure polyopia may result. In his later paper, Bull shows that long-continued winking or pinching the lids together may cause also asthenopic symptoms, which he explains as being due to irritation of the cornea, which is rich in nerves. The heat from a lamp may, by causing evaporation of the tears, lead to dryness of the cornea, and thus produce asthenopic symptoms. BERGER.

MAHER (567) relates the case of three children who suffered from glioma out of a family of four. One, seven years old, had both eyes removed when about two years old. No recurrence. The second, now five, had both eyes removed when two. No recurrence. The third, now three and a half, had left eye removed when one. There is no return. Pathological examinations proved the cases to be true glioma. ALLING.

A striking example of the well-known fact that glioma of the retina may occur in children of the same family is presented in the report of NEWTON (568). The family consisted of sixteen children. Of these two died within two months of birth. Four are still alive and well, but the remaining ten have all been affected with glioma of the retina, all of whom, except one, are dead. Of the ten cases, only three, two of which were operated upon, were unilateral. Of the seven children who died without operation, the eyeball ruptured in every case except one which died of cerebral complications. ALLING.

XX.—OPTIC NERVE.

569. **Ruge, Sophus.** A case of papillo-retinitis from botulismus. *Zehender's klin. Wochenschr.*, xl., p. 408.

570. **Krauss.** On optic-nerve affections in cases of deformity of the skull. *Inaug Dissert.*, Giessen, 1902.

571. **Wetz.** Statistics of optic neuritis. *Ibid.*

572. **Snegireff.** Spermin in optic-nerve atrophy. *Wjest. Ophth.*, 1902, 4-5.

573. **Aalbertsberg.** Optic neuritis following the use of thyroid gland. *Weekbl. v. het Ned. Tydschr. v. Geneesk.*, ii., No. 22.

Ruge (569) saw in the Greifswald clinic a case of papillo-retinitis in botulismus, with slight paralysis of both external recti, and almost complete internal ophthalmoplegia. Recovery took place in five weeks. The cause was probably spoiled meat. In two cases, previously reported, of paralysis of accommodation in consequence of botulismus, no changes in the discs were observed. Only Gutmann and Cohn have found this condition.

Krauss (570), after reviewing the papers on optic-nerve affections due to deformities of the skull, reports three new cases from the Giessen clinic. In the first case there was atrophy with asymmetry of the facial bones and hyperostoses along the sagittal suture. He believes the cause to be a narrowing of the optic canal. In the second case there were asymmetry of the face and oxycephaly. The third case was one of microcephalus with atrophy. No anatomical examinations were made.

Snegireff (572) used spermin injections in 27 cases of optic-nerve atrophy (in tabes, alcoholism, and retinitis pigmentosa, and after neuro-retinitis, erysipelas, and syphilis), obtaining the following results: 1. Appreciable improvement in vision in only 25 %; in the other 75 % no improvement, or failure in vision. 2. Improvement can be hoped for only when there is vision of 0.5 or better. 3. The field must not be greatly contracted. 4. The number of injections required varies from twelve to twenty-nine. Spermin at least should be classed with the remedies useful in optic-nerve atrophy. Hirschmann.

Aalbertsberg (573) saw a patient with myxœdema who had been treated with thyroid gland. The effect on the disease was favorable, but the patient began to complain of poor vision in the left eye. Examination revealed optic neuritis. Later vision failed in the right eye and a low degree of neuritis was found here. The use of thyroid was stopped immediately and the con-

dition of the eyes improved. In the left eye, however, an atrophy of the nerve came on. Coppez alone has observed cases of this sort. JITTA.

XXI—INJURIES, FOREIGN BODIES, PARASITES.

574. **Lehmann** and **Cowl.** Complete perforation of the eyeball by a splinter of iron, with a contribution to diagnosis by means of the Roentgen rays. *Centralbl. f. Augenheilk.*, xxvi., p. 290.

575. **Nathanson.** Double perforation of the walls of the eyeball by a splinter of iron. *Wratsch*, 1902, 39–40.

576. **Braunstein.** A comparative estimate of the value of different methods of extracting splinters of iron from the eye. *Wjest. ophth.*, 1902, No. 6.

577. **Amman.** On the earning capacity of those with injured eyes. *Zeitschr. f. Augenheilk.*, Nov., 1902.

578. **Silfast.** A case of lesion of the eye from lightning. *Finsk. läkoresällsk. handl.*, March, 1902.

579. **Panas.** Amblyopia and amaurosis from an electrical discharge. *Arch. d'opht.*, xxii., 10, p. 625.

580. **Terrien.** On the prognosis of visual disturbances of electrical origin. *Arch. d'opht.*, xxii., 11, p. 692.

581. **Christiansen.** A case of shot injury through the central visual tracts. *Nord. med. Arch.*, 1902, ii., No. 2.

582. **Hansell.** Injuries of the eye productive of diseases of the uveal tract. *Jour. Amer. Med. Assoc.*, Sept. 27, 1902.

583. **Shumway.** Severe burn of the eye and face by nitrite of amyl with loss of eye. *Phil. Med. Jour.*, Oct. 11, 1902.

LEHMANN and COWL (574) add another to the twenty-one reported cases of double perforation of the ball. Haab and Hirschberg magnets negative, lateral radiograph showed a foreign body *22mm* behind the cornea two months after the injury. Volkmann's giant magnet then also negative. Two and a half months later a radiograph, the patient holding the photographic plate between his teeth. The anterior portion of the eyeball was marked with a gold shell. The foreign body again appeared *22mm* behind the cornea. With extreme lateral movements of the eye the foreign body was seen to move also, which seemed to indicate that it lay within the ball. Enucleation showed the foreign body *1.5mm* behind the sclera in a mass of fat near the optic nerve. The authors advise early radiography before the ball shrinks, and they recommend horizontal projection. A threatening suppuration in the vitreous was prevented by the introduction of iodoform discs. Later the retina became detached and there was a painful phthisis bulbi.

NATHANSON (575) reports two cases. In one a piece of iron 7 x 3 and 5 x 1.5*mm* perforated the lid and the ball in the ciliary region beneath the external rectus and stuck fast, one-third of it outside and two-thirds inside the ball. Sixteen days after the injury there was a sympathetic optic neuritis in the other eye, and vision was reduced to 0.2. After enucleation, the second eye quickly improved and the vision increased to 0.9.

In the second case a splinter of iron 4.5 x 2 x 0.5*mm* passed through the cornea, lens, and sclera, and lay 1*cm* beneath the optic nerve in the orbital tissues. An attempt at magnet extraction was not successful. The eye was enucleated.

HIRSCHMANN.

BRAUNSTEIN (576) from his own observations and cases described by others concludes that at present the small magnet of Hirschberg is best adapted for the removal of foreign bodies. The large magnet as now made is inconvenient and in some degree dangerous. It should be used only in cases in which other instruments are not successful and in which a restoration of vision is not hoped for. For diagnostic purposes only the sideroscope and radiography should be used. In regard to the efficacy of the new Volkmann magnet, nothing can be said until further clinical experience is gained. HIRSCHMANN.

AMMAN (577) has investigated the incomes of a great number of persons who had suffered injuries of the eyes and found that the financial damage was usually rated too high. The efficiency of common laborers is scarcely lessened even when central vision in the damaged eye is reduced to 0.1 or 0. A skilled laborer or one in a position of danger, who is obliged to give up his post after an injury, loses 10–20 per cent. A person who has had a traumatic cataract successfully removed is injured only about 5 per cent., since the lack of stereoscopic vision is overcome in about a year.

SILFAST'S (578) patient was a healthy woman of forty-five who was struck by lightning and fell unconscious. The condition eighteen hours after the injury was as follows. The right brow and lashes were singed. On the forehead and temple, near the right eye, there were numerous superficial burns. The lids of both eyes were swollen and red. Photophobia. Hyperæmia of the tarsal conjunctiva. Bulbar conjunctiva œdematous. Circumcorneal injection. Right cornea clear; left with striated and

punctate superficial opacities. Apparently hyperæmia of the iris; pupils unequal and sluggish and did not dilate in the first twenty-four hours after the use of atropine. Movements of the hand recognized at *2m*. The cloudiness of the left cornea cleared up in five days. The lens of the right eye began to grow cloudy about the posterior pole and the opacity increased until it was impossible to see the fundus. Three weeks after the injury the lens began to clear up and in six weeks the opacity had quite disappeared. The eyes were now normal and vision was normal. From the similarity of the clinical picture with that produced experimentally by Widmark, the author inclines to the belief that in his patient the ocular symptoms produced by the lightning were for the most part due to the ultra-violet rays in the flash.

DALÉN.

PANAS (579) saw in a man of twenty-six from the short-circuiting of a current of 560 volts, besides the well-known changes in the face and conjunctiva, a marked amblyopia with contraction of the field, particularly above, disturbances in the color-sense, hemeralopia, and ciliary neurosis. Ophthalmoscopically there was hyperæmia of the retina; R, V = $\frac{1}{6}$; L, V = $\frac{1}{4}$. The writer describes the symptoms mentioned by other authors as being due to this cause and to flashes of lightning. The cataract may, when it develops quickly and at the posterior pole alone, be due to the catalytic action of the electric current. When the cataract develops slowly, the fundus changes cause it. The permanency of the opacity depends upon the resistance of the person's nervous system. Not infrequently the shock is the essential cause and the picture of hystero-traumatic amblyopia develops, as Panas observed in a young man who in lighting a stove had a flame flash in his face, which so frightened him that without suffering any injury he became completely blind.

v. MITTELSTÄDT.

TERRIEN (580) describes the ocular changes caused by the short-circuiting of currents of high voltage as observed by him in 45 cases, and he endeavors to lay down some rules for prognostication after these injuries. The injury always occurred in the same manner and at a distance of 30–50*cm* without the body being affected by the current. He distinguishes vascular or inflammatory, and functional or nervous symptoms. To the former belong a conjunctivitis that is very resistent to treatment, cloudiness of the cornea (observed once), and hyperæmia of the iris.

Iridocyclitis and cataract, described by others, were not seen by him. The disc and retina exhibit the picture of a syphilitic chorio-retinitis of moderate severity. The process is probably an œdema. These latter symptoms are present even in the mildest cases and therefore form an important diagnostic sign. These exist often with almost normal vision and disappear without leaving a trace. In but rare cases does optic-nerve atrophy result.

Among the functional disturbances are the immediate dazzling, followed by erythropsia, amblyopia, and usually a concentric contraction of the field. In favorable cases acuteness and field of vision may become normal in three or four weeks. Sensory disturbances consist in photophobia and headache, and sensitiveness of the ciliary region and of the points of exit of the nerves at the margin of the orbit. Motor disturbances consist in blepharospasm, contraction and rigidity of the pupil, and a very unfavorable symptom—dilatation of the pupil after contraction while the illumination remains constant. A dilated and unresponsive pupil is also unfavorable. There was in some cases lachrymation. Tension is always normal.

In the diagnosis, especially when there is a suspicion of simulation, the possibility of traumatic neurosis should be borne in mind.

The prognosis is hard to make. The distance of the flash, the intensity, and the duration must be taken into account. The fact that the patient is able to work after the accident is of no prognostic value and does not exclude an unfavorable ending. Long-continued photophobia and a recurring conjunctivitis also indicate a severe course. The cloudiness of the retina, which is found in the mildest cases, is of no prognostic value. The disturbances in the acuteness and in the field of vision may not correspond in degree. At times these symptoms are severe and transitory, at others slight but of long duration. The final result depends more upon the duration than the degree of these symptoms. Headache and sensitiveness of the eyeball to pressure indicate severe cases. Treatment is of little efficacy. Cocaine ointment was not found to have the disadvantages observed by Maklakoff. Of internal remedies bromide of potassium seemed to be most efficacious. v. MITTELSTÄDT.

CHRISTIANSEN'S (581) patient was a woman of thirty who was brought to the hospital with a shot wound entering the brain *6cm* behind the right auditory meatus. She was conscious and had no paralysis, convulsions, or disturbances of sensation. Complete

blindness, pupils dilated, and not responsive. Fundus normal. The sight improved rapidly and in a week the patient could read small type. Then a complete homonymous hemianopsia was found, such as would be caused by a lesion of the right optic tract. The fields corresponding to the left optic tract were concentrically contracted. Central vision was not affected in either eye. After this the fields grew larger, but there remained in the left halves of the fields (right tract) a defect downward, and in the right halves a defect directly to the right. Six weeks after the injury the ball was removed by trephining on the left side, and the patient was discharged in good condition. Six months later the defects in the fields were as before. The patient was soon brought to the hospital again with a fresh shot injury in the right temporal region, and died the following day without regaining consciousness. The first wound, which alone is of interest, lay *6cm* above and behind the auditory meatus, *3cm* above a transverse line through the upper margin of the zygoma, and *12cm* horizontally behind the orbital process of the frontal bone. The path of the bullet led into the first temporal gyrus and then passed to the left and downward and backwards, so that the medial exit in the right hemisphere involved the anterior portion of the cuneus and the anterior third of the upper and lower lips of the calcarine fissure, and the parts about the continuation of this fissure from the apex of the cuneus. In the left hemisphere the medial opening was slightly lower and posterior to that on the right side, but the wound here also involved the anterior portion of the calcarine fissure and the adjoining portions of the cortex. The lateral exit from the left hemisphere lay in the upper anterior portion of the third occipital gyrus.

This case throws light on some of the moot points in regard to the central course and cortical ending of the visual paths.

Among the writer's conclusions are the following: The case proves that Henschen's view, that the macular fibres end in the anterior portion of the calcarine fissure, is not correct. The path of the bullet ran directly through the anterior portion of the calcarine fissure and destroyed the adjoining cortex. The lesion was symmetrical, so that there can be no question of one centre acting vicariously for the other. And, notwithstanding the bilateral localization of the lesion, the patient read easily the finest print a week after the injury, and in examination of the visual fields central vision was found to be preserved in each eye.

The path of the bullet ran in the right hemisphere through the upper portion of Gratiolet's bundle, and in the left hemisphere through the middle of the same bundle. Comparing the location of the permanent defects in the fields of vision, it appears, according to the writer, that the fibres of the upper quadrant of the retina run in the upper portion of Gratiolet's bundle, and the fibres of the extreme nasal and temporal portions of the retina run in the middle of the same bundle. In this respect the case supports Henle's view that the fibres of the upper quadrants of the retina run in the upper so-called dorsal portion of Gratiolet's bundle, while the fibres of the lower quadrants run in the lower so-called central portion. DALÉN.

HANSELL (582) points out the importance of syphilis, diabetes, and tuberculosis in their pernicious influence on the course and termination of cases of traumatism. ALLING.

Nitrite of amyl is supposed to have no irritating properties. The caustic action in the case related by SHUMWAY (583) is explained by a decomposition which is said to take place after prolonged exposure to light, resulting in the formation of nitric and nitrous acids. ALLING.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASES.

584. **Ferron.** Unilateral intrinsic or extrinsic ophthalmoplegia from basilar lesions. *Ann. d'ocul.*, cxxviii., No. 5, p. 351.

585. **Gerok.** On purulent metastatic ophthalmia. *Württ. med. Correspondenzbl.*, 1902.

586. **Gourfein.** Note on the recovery from an attack of primary glanders of the eye. *Rev. méd. de la Suisse romande*, May 5, 1902.

587. **Haltenhoff.** A case of leprosy with ocular manifestations. *Ibid.*, April, 1902.

588. **Stölting.** The ocular results of quinine poisoning. *Graefe's Archiv*, lv., 1, p. 385.

589. **Suker.** A paresis of the left abducens and a convergent strabismus in the right eye with peculiar visual fields—all being due to hysteria in a man of seventy. *Ophth. Record*, Sept., 1902.

FERRON (584), after examining the reported cases of ophthalmoplegia interna and externa that have been carefully examined clinically and anatomically, comes to the following conclusions: 1. The fact, established clinically and anatomically, that there is a partial decussation of the oculomotor fibres does not accord with the idea of a nuclear lesion in unilateral ophthalmoplegia externa or interna. 2. Both clinically and anatomically it has been proved

that with a basilar lesion of the oculomotor there may be a partial paralysis of the fibres leading to a unilateral ophthalmoplegia externa or interna. BERGER.

GEROK (585) reports two cases of metastatic ophthalmia, in one of which, a case of puerperal sepsis, the woman recovered. In the second case, the ocular affection was the forerunner of a cryptogenic pyæmia diagnosed later and possibly arising from an ulcer of the lower lip from which cultures of staphylococcus pyogenes aureus were obtained.

GOURFEIN (586) in 1897 reported a case of primary glanders of the eye. He continues the history of the case and reports that the recovery has been permanent. Except for a small scar in the region of the previous fistula of the lachrymal sac, and a slight thickening of the bulbar conjunctiva at the inner angle, nothing abnormal is to be seen about the eye. The number of reported cures of glanders of the eye is twenty-three.

The case of lepra of the eye which HALTENHOFF (587) reported is noteworthy because of the relatively late appearance of the ocular affection (episcleral nodules on both eyes with involvement of the anterior layers of the cornea) and of the existence of partial gigantism, which led to the suspicion that the pituitary body had been invaded by the lepra bacillus.

STÖLTING (588) observed in a young man who had for a long time taken 3 grammes of quinine daily a marked contraction of the visual field and very narrow arteries. Soon an atrophy of the iris developed and gradually increased. He believed the atrophy to be due to an affection of the vessels of the iris from the quinine, and the visual disturbances to be due to the constriction of the retinal arteries.

The diagnosis of hysteria in the case reported by SUKER (589) was made by exclusion, by the transposition of the color fields, and by the peculiar tube-like field which has been described as characteristic of this condition. ALLING.

BOOK REVIEWS.

I.—**Klinische Studien über die Krankheiten der Retinalgefaesse. Clinical Studies on the Diseases of the Retinal Blood-vessels.** By Dr. OLE BULL. With 41 visual-field charts and 30 ophthalmoscopic plates. Leipzig: Veit & Comp., 1903. Mk. 24 ($6).

This elegantly gotten-up work of 82 pages, in foolscap folio of thick, unpleasantly glossy paper, profusely illustrated in the best style and finish, does great credit to the publishers, and the generous patron of science, Consul Ivar Huitefeld.

The numerous drawings in black exhibit the visual fields in large circles, and their defects in cleanly executed parallel- and cross-hatched engravings. The 30 colored plates depict the background in unexcelled clearness.

The text begins with an historical introduction of 13 pages, on the pathology of the blood-vessels and their contents. The fundamental investigations of Virchow and his predecessors in this field, CRUVEILHIER about 1825, VICTOR ALIBERT, 1828, FRANÇOIS ("Essay sur les gangrènes spontanées," Paris, 1832), are very well presented. Embolism, hemorrhagic infarction, metastatic abscess, thrombosis, etc., are now well known, yet, of late, more attention is again bestowed on the pathologic conditions of the vessel-walls, especially endarteritis with its consequences. Angioneurosis may also play a great part. These numerous and important conditions can be studied on the retinal vessels *in vivo*. Pathologic alterations in the walls of the vessels are now considered to be the most frequent cause of vascular disturbance. The ophthalmoscopic conditions, both those caused by anatomic changes and those of angioneurotic origin, vascular spasms, especially when contracting only a part of the vessel, deserve to be well studied. The last two plates (syphilitic changes) are very fine.

The author, whose valuable former contributions to ophthalmology are well known, is to be congratulated on the production of such an important and elegant monograph. H. K.

II.—**Die augenärztlichen Operationen** (The Operations on the Eye). Thirteenth and fourteenth numbers. By Dr. WILHELM CZERMAK, Professor of Ophthalmology at the German University of Prague. Karl Gerold's Son. I. Barbaragasse 2. Vienna, 1904.

We welcome the continuation of Czermak's large work. The double number commences at page 813 with the conclusion of the treatment of foreign bodies.

At page 822, the Operations on the Lens begin and are broken off at the last page, 940. Thirty-two pages are occupied by a condensed historical introduction of the cataract operation, with an extensive bibliography. Then follows (p. 854) the **Discission,** applied (*a*) to soft cataracts, chiefly in children; the method of absorption, supplemented by the so-called linear extraction; letting out the soft lens substance in case of occurrence of glaucomatous symptoms, through a straight opening in the cornea; (*b*) to split the lens capsule after removal of the lens (after-cataract). After detailed descriptions of the operative technique, the author enters into critical expositions of unusual conditions, manifold accidents, and variations in the performance of the operations. His criticisms are well supported and perfectly unbiassed, showing no predilections for Austrian methods. The reviewer may be allowed to copy one sentence: "The *gute Geschick* [kind fate], to which DA GAMA PINTO attributes the results of KNAPP, cannot be taken seriously. We might just as well expl .n his results from posterior discission [splitting the capsule from behind with a needle introduced through the sclera and the vitreous—a method practised in Vienna and Prague] by a kind fairy moving over his hands. This would end all judgment based on results" [in other words, results depend on luck], p. 876.

One and a half pages are given to the continuation of iridectomy with discission, and two and a half pages to the discission with the forceps-scissors, the pince-ciseaux of De Wecker.

The **extraction** begins on p. 888, and receives a most detailed, remarkably clear, and comprehensive presentation: (*a*) the extraction with the lance—linear extraction; (*b*) the flap extraction, with and without iridectomy; (*c*) the combined extraction—peripheral section with iridectomy.

The present number stops at the "Disturbances of the Recovery." It is in keeping with the excellence of the former issues. No ophthalmologist, even if he has only a moderate reading acquaintance with the German idiom, should ignore Czermak's Eye Operations. For the German it is easy reading, which cannot be said of all German books, and the oculists of other nations will be repaid for their trouble by broad clinical instruction and most useful technical advice. H. K.

III.—**Manual of the Diseases of the Eye.** By CHAS. H. MAY. Third edition, 12mo, 410 pages, with 275 original illustrations, and 16 plates, with 36 colored figures. Cloth, $2. Wm. Wood & Co., New York, 1903.

This third edition, following shortly after the two former ones, is revised and somewhat enlarged. We mention it here to repeat our commendation of its excellent character as a text-book for students and general practitioners. This judgment is endorsed by the appearance of a translation into German, under the title:

IV.—**Grundriss der Augenheilkunde,** von Dr. CHAS H. MAY, Chef der Augen-Klinik der medicinischen Abtheilung der Columbia Universität in New York. Bearbeitet von Dr. E. H. OPPENHEIMER, Augenarzt in Berlin. A. Hirschwald, 1903. 444 pages.

V.—**Elementary Ophthalmic Optics.** By FREELAND FERGUS, M.D., F.R.C.S.E., Surgeon to the Glasgow Eye Infirmary. London: Blackie & Son, 1903.

A nicely gotten-up 16mo, of 106 pages, of elementary optics, specially designed for students that are beginning their ophthalmic careers. It gives a clear exposition of all that is absolutely necessary for the modern oculist, and what it offers is only an introduction to the study of physiologic optics and their anomalies. As a preliminary he defines the rudiments of trigonometry; measurement of angles; values of sine, cosine, and tangent; limiting values of these, and certain properties of a triangle. Then follow: Chapter I.—The properties of light: reflection, modes in which light moves, movement of fluid particles, simple harmonic motion, mirrors, and their images. Chapter II.: refraction of light, depends on change of velocity; prisms and their use; lenses, their properties and applications. In this chapter, a good deal of elementary algebra and geometry is put in use. The book is excellent, and students of only a modest college education need not shrink from it. H. K.

VI.—**Atlas of the External Diseases of the Eye, Including a Brief Treatise on the Pathology and Treatment.** By Prof. O. HAAB, M.D. Authorized translation from the German. Second edition, revised. Edited by G. E. DE SCHWEINITZ. W. B. Saunders & Co., Philadelphia, New York, and London, 1903.

Too much good cannot be said on the usefulness of this Atlas and Epitome of External Diseases of the Eye. The student and general practitioner, the eye specialist, the teacher, and every medical man who does not consider ophthalmology a doctrine altogether sealed to him, will peruse and study this 12mo volume, illustrated by many dozens of colored pictures, drawn from nature, with delight and profit, not only in rounding up his knowledge, but to make good use of it, for the clinical descriptions, the pathology of the affection, and the treatment of the patient are clear and to the point. The reviewer does not share the opinion that eye-patients should be a *noli me tangere* for the general practitioner, who cannot shirk it anyhow, for the one-minute-old baby up to the cataractous octogenarian will claim his help, imploring him to do his best; and where a case is beyond his competency he may consult. Ophthalmic knowledge, such as is bestowed by the book before us, will make his general competency broader, relieve many of his patients by treating them, or showing them where they may get the proper help: "*non omnia possumus omnes.*" This edition is greatly improved. The man that will derive most benefit from it is the post-graduate who prepares himself for ophthalmic surgery. H. K.

VII.—**Lessons on the Eye,** for the Use of Undergraduate Students. By FRANK L. HENDERSON, M.D. Third edition. Philadelphia: P. Blackiston's Son & Co., 1903.

This neatly gotten-up little volume, 12mo, 195 pages, is well adapted to the requirements of the persons to whom it appeals.

H. K.

VIII.—**Ocular Therapeutics,** According to the Most Recent Discoveries. By Dr. A. DAVIES, translated by SYDNEY STEPHENSON. London: Churchill, 1903. 10/6 net.

Sydney Stephenson deserves the gratitude of that part of the English-American medical public which is not acquainted with the French idiom, by taking the trouble to translate the work of the versatile and indefatigable investigator in the new field of therapeutics. In spite of a good deal of adverse criticisms of Davies's conceptions, many of his results have been irrefutably

confirmed, and some are in general use, to the benefit of mankind—for instance, dionine, and others of the new class of ocular analgesics. The 8vo volume, of 278 rather concisely printed pages, contains the bulk of modern ophthalmic therapeutics.

H. K.

IX.—**Diseases and Injuries of the Eye, with their Medical and Surgical Treatment.** By GEO. and ARNOLD LAWSON. Sixth edition, with 249 illustrations. Revised and, in a great measure, rewritten by Arnold Lawson. An 8vo volume, of 587 pages, nicely printed on good paper, not heavily leaded, describes carefully all that comes before the ophthalmic practitioner. It deserves to be carefully read; most chapters are written with a good deal of painstaking and accuracy, others are lacking in just those qualities. A formulary of seventy prescriptions and an extensive index contribute not a little to the usefulness of the volume. H. K.

X.—**Text-Book of Diseases of the Eye,** for Students and Practitioners of Medicine. By Drs. HOWARD F. HANSELL and W. M. SWEET, with chapters by C. R. HOLMES, C. A. WOOD, and WENDELL REBER. With 256 illustrations. Philadelphia: P. Blackiston's Son & Co. $4 net.

This text-book of 532 pages is well written, well gotten up; the authors have a good reputation as to competency and carefulness, with teaching and literary ability, yet it is hard to repress the question: Is the production of the conventional ophthalmic text-books not overdone? It is certainly legitimate, but if able men used their eyes, hands, and brains more to increase our stock of knowledge than to popularize it, authors, publishers, and the profession would be the gainers. Over-production has, however, a good side: a poor text-book is doomed to fall flat. This digression is not aimed to detract from the value of Drs. Hansell and Sweet's book, which can be recommended as justly as almost any one in its line. H. K.

Obituary.

Dr. **Ernst Pflüger,** professor of ophthalmology and executive surgeon of the Ophthalmic University Clinic at Berne, born July 1, 1846, at the Berner village Bueren, died suddenly, September 30, 1903. He received his college and university education in his own country (University of Berne, 1865–1869). The next year he was assistant at the Berne Ophthalmic Clinic under Dor. His further studies under Donders, Bowman, Critchett, Arlt, Jäger, and others determined him to settle at Lucerne as oculist and aurist. In 1876 he accepted a call to the University of Berne, succeeding Professor Dor who had settled at Lyons (France). He remained in this position until his death — an excellent teacher, an indefatigable, ambitious, and successful worker in the science and art of his department, belonging to the foremost men in his country. He was a regular attendant of ophthalmological conventions, and distinguished himself in almost all branches of eye surgery. In 1878 he introduced boric acid into the practice of ophthalmology. He cultivated the methods of functional examination with great zeal: ophthalmoscopy, skiascopy, ophthalmometry (Javal's instrument); astigmatism, acuteness and field of vision, color perception, and their anomalies, as well as refractive errors, were favorite occupations for him and his assistants which they cultivated with great zeal and accuracy, as numerous publications testify.

Intraocular tension, glaucoma, mydriatics and myotics attracted his particular interest. He was one of the chief supporters of the myopia operation of Fukala, and published an important monograph, supported by extensive personal statistics, in French. He was a zealous and conscientious clinician, painstaking and kind to the humblest, a faithful teacher, and a progressive scientist. His long endeavor to inaugurate an ophthalmic eye clinic at the University, worthy of his city and state, was conceded to him; he worked at the plans, but did not see the realization of his fondest wish. Socially he was very popular; he was unassuming, obliging, and modest. All that knew him loved him.

H. K.

Dr. **Simon Pollak,** St. Louis, Mo., born in Tauss, a small city

near Prague, Bohemia, April 14, 1816, received the degree of M.D. in Prague in 1835, the degree of Doctor of Surgery and Obstetrics in Vienna in 1836; he was an interne at the Maternity, Vienna, thirteen months. Arrived in New York, July 4, 1838, he left for New Orleans, December, 1838, where he remained two months. Was in smaller Southern towns until March 14, 1845, when he settled in St. Louis, Mo.

Assisted in founding the Missouri Institute for the Education of the Blind in 1850.

Visited Europe to study the diseases of the eye and ear in 1859, where he remained twenty-two months, studying principally in Paris, Vienna, Berlin, and London.

Returned to St. Louis in 1861, but finding the city disrupted by the war, he went to New York almost immediately with the intention of making his home there. While in New York he assisted in founding the United States Sanitary Commission, with Doctors Bellows, Agnew, Harris, Howe, and Van Buren. Shortly afterwards, returned to St. Louis at the request of the United States Sanitary Commission to represent them in the West, where he also joined the Western Sanitary Commission which was founded in St. Louis. About this time, he organized the first Eye and Ear Clinic west of the Mississippi, at Mullanphy Hospital in St. Louis. About 1863 he was appointed General Hospital Inspector United States Sanitary Commission, with the approval of the Secretary of War, at a salary of $250 per month. He accepted this position and declined the salary. Married December 29, 1863, to Miss Sarah Perry of Cincinnati, O. Resided in St. Louis continuously until his death, October 31, 1903.

He was known as a prominent oculist and teacher, active, and very popular throughout his unusually long life. At his last birthday his friends and colleagues tendered him a great ovation in a splendid dinner. H. K.

Ricardo Secondi was professor of ophthalmology at the University of Genoa, Italy, from 1860 to his death, which occurred October, 1903, in his 72d year. He studied in Pavia and Vienna, and was assistant to Prof. Flarir in Pavia. He was one of the most prominent oculists in Italy, renowned as a teacher, writer, and practitioner. He published numerous papers of more than passing interest. He was rector of the University of Genoa in 1871, and "senatore del regno" since 1882. H. K.